Whytes Gully Landfill Annual Review 2013-2018

Project Approval MP11_0094

8201819601

Prepared for
Wollongong City Council

26 August 2019

wollongong
city of innovation

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Document Information

Prepared for	Wollongong City Council
Project Name	Whytes Gully Landfill Annual Review 2013-2018
File Reference	8201819601 R003 Whytes Gully Annual Review Rev4.docx
Job Reference	8201819601
Date	26 August 2019
Version Number	4
Effective Date	26/08/2019

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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
1, 2	-	Internal Review	AH, MS, MB	AJL
3	8/05/2019	Draft for client review	AH, MS, MB	AJL
4	26/08/2019	Final following review from Wollongong City Council and NSW Department of Planning and Environment	MB	AJL

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1 Introduction

1.1 Background

Wollongong City Council (WCC) owns and operates the Wollongong Waste and Resource Recovery Park (the 'site') or (WWARRP), which is located on Reddals Road, Kembla Grange NSW. The site is situated at the foothills of the Illawarra Escarpment south-west of the Wollongong central business district on approximately 50 hectares. The site is formally identified as Lots 50, 52 and 53 of Deposited Plan (DP) 1022266 and Lot 2 of DP 240557.

The site location is shown in **Figure 1** of **Appendix F** and a site plan provided in **Figure 2** of **Appendix F**.

The site was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. The 'western gully' section was landfilled until 1993, after which the 'eastern gully' section has been in operation. The site currently receives all municipal solid waste (putrescible and non-putrescible) generated within the Wollongong local government area (LGA), commercial waste drop-off and private customer drop-off for recycling and landfilling.

With existing landfill airspace at the site projected to expire in late 2013, WCC proposed a staged new landfill cell that would create approximately 7 million cubic metres of additional landfill capacity. This new cell would be constructed adjacent to the existing waste footprint and then filling the new cell and overfilling (i.e. piggy backing) the existing waste.

An Environmental Assessment (Golder, 2012) for the project was submitted with the Major Project Application to the (then) Department of Planning and Infrastructure (now Department of Planning and Environment (DPE)) under part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Project approvals, licences and agreements

On 3 April 2013, the DPE conditionally approved the Major Project Application (MP11_0094) for the new landfill cell. Project Approval (PA) was issued and sets conditions for environmental impacts, management and reporting. Two modifications to the PA have been submitted and approved for the new landfill cell pursuant to Section 75W and Clause 12 of Schedule 6A of the EP&A Act:

- Modification 1 (MP11_0094 MOD 1): Modification of operating hours. Approved on 11 April 2018.
- Modification 2 (MP11_0094 MOD 2): Modification of the eastern gully drainage channel alignment to be predominantly outside the landfill footprint. Approved on 29 May 2018.

WCC holds an Environment Protection Licence (EPL) issued by the NSW Environment Protection Authority (EPA) under the *Protection of the Environment Operations Act 1997* (POEO Act). The Licence Number is 5862 and authorises the scheduled activity of waste disposal (application to land) at the Site with no limit on the scale of the activity.

In addition, WCC has held a number of Trade Waste Agreements with Sydney Water for the site. The most current agreement is dated 14 August 2017 and gives consent to discharge industrial trade wastewater.

The approvals, licences and agreements that are applicable to this site are summarised in **Table 1-1**.

Table 1-1 Project approvals, licences and agreements and compliance status

Approval / Licence / Agreement	Nature of document	Relevant authority	Date
Project Approval MP11_0094	Development consent	NSW DPE	3 April 2013
- Schedule 3 Administrative Conditions			
- Schedule 4 Specific Environmental Conditions			
- Schedule 5 Environmental Management, Monitoring, Auditing and Reporting			

Approval / Licence / Agreement	Nature of document	Relevant authority	Date
- Appendix 1 Proponent's Statement of Commitments			
- Appendix 2 Site Layout Plans and Drawings			
Modification Application MP11_0094 MOD 1	Modification to consent	NSW DPE	11 April 2018
Modification Application MP11_094 MOD 2	Modification to consent	NSW DPE	29 May 2018
Environment Protection Licence (EPL) 5862	Environment protection licence	NSW Environment Protection Authority	29 May 2008
Trade Waste Agreement 11205	Trade waste agreement	Sydney Water	14 August 2017

1.3 Management Programs and Plans

A number of documents have been prepared to ensure that environmental compliance is maintained throughout site construction and operation, as required by the Project Approval.

An Integrated Operational Environmental Management Plan (IOEMP) was compiled, including the Landfill Environmental Management Plan (LEMP) (Golder, 2014), on behalf of WCC to ensure that environmental compliance is maintained throughout site operations. The management measures provided in the LEMP were developed in consideration of the *NSW Environmental Guidelines: Solid Waste Landfills (*EPA, 1996*)* and also addressed the monitoring and reporting requirements of the environmental protection licence (EPL 5862) and Trade Waste Agreement with Sydney Water held for the site.

This IOMP includes the following documents:

- Landfill Environmental Management Plan (Golder, 2014), which includes the following environmental management documents:
  - Landfill Master Plan (Golder, 2012).
  - Standard Operating Procedures Checklist.
  - Noise Management Plan (Golder, 2016).
  - Soil, Water and Leachate Management Plan (RIENCO Consulting, 2008).
  - Flood Emergency and Evacuation Plan (Golder, 2013).
  - Landscape Strategy (Corkery Consulting, 2012).
  - Vegetation and Biodiversity Management Plan (Biosis, 2013).
  - Community Education Program (2012/13).
- Landfill Gas Management System (Golder, 2014).
- Asset Management Plan (Golder, 2013).
- Site Safety, Emergency and Business Continuity Management Plan (Golder, 2013).
- Fraud Prevention and Control Plan (Golder, 2013).
- Waste and Resource Recovery Monitoring Program (LGA-wide).

In addition, the following documents have also been prepared:

- Construction Environmental Management Plan Framework (Golder, 2016), including:
  - Construction Traffic Management Plan (GTA consultants, 2013).
  - Vegetation Management Plan (Biosis, 2013).
- Activity-specific Construction Environmental Management Plans
- Construction Quality Assurance Plan for Package 2 and 3 Landfill Cells
- Pollution Incident Response Management Plan (PIRMP) which is a POEO Act requirement.

1.4 Purpose of this Report

The purpose of this Annual Review is to provide the DPE with a report of the site's environmental performance, actions taken in relation to environmental control and compliance with development consent Project Approval MP11_0094, and two modifications to this consent (MP11_0094 MOD 1 and MP11_0094 MOD 2). Condition 5 of Schedule 5 of the Project Approval outlines the requirement for WCC to prepare an annual report.

Table 1-2 outlines the content included in this report to address the requirements of Schedule 5, Condition 5 of the Project Approval, and where this content is provided.

Table 1-2 Condition 5 of Schedule 5 requirements and Annual Review section

Condition	Requirement	Annual Review section / response
5	One year after the commencement of operation, and annually thereafter, the Proponent shall review the environmental performance of the Project to the satisfaction of the Director-General. This review must:	This document has been prepared in response to the requirements of Schedule 5, Condition 5. The report focuses on the period 29 May 2017 to 28 May 2018 to coincide with EPL reporting requirements, and also provides reference to results from 3 April 2013 to 28 May 2018.
(a)	describe the operations that were carried out in the past calendar year;	See Section 2
(b)	analyse the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:	See Section 3 for monitoring results, analysis and comparison against relevant criteria. See Section 4 for complaints results, analysis and comparison against relevant criteria. It is noted that the comparison of results from the reporting period with monitoring results from previous reporting period is not relevant as this is the first Annual Review. However, analysis of monitoring results has been compared between years within the monitoring period.
	• relevant statutory requirements, limits or performance measures/criteria;	
	• monitoring results of previous years; and	
	• relevant predictions in the Environmental Assessment (Golder 2012);	
(c)	identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	See Section 5
(d)	identify any trends in the monitoring data over the life of the Project;	See Section 3 for environmental components. See Section 4 for complaints.
(e)	describe what actions will be implemented over the next year to improve the environmental performance of the project (including a timeline for the completion of each action); and	See Section 5
(f)	be placed on Council's website within 2 weeks of its completion.	This report will be submitted to the DoP and will be made available to the public via WCC's website (http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx).

This Annual Review is the first of its kind under the Project Approval since operation commenced in 2013. While the report focuses on covering the period 29 May 2017 to 28 May 2018 to coincide with EPL reporting requirements, it also provides reference to results since project approval on 3 April 2013. It is envisaged that consequent Annual Reviews will be produced on an annual basis to coincide with the EPL reporting period.

1.5 Consideration of compliance

1.5.1 Assessment of Compliance

Consideration of compliance with the Project Approval and modifications is provided in **Appendix A** of this document. Consideration of compliance with the various IOMP, LEMP, CEMPF and their subplans is provided in **Appendix B** of this document.

This Annual Review identifies the relevant environmental monitoring requirements as identified in the EPL licence, Trade Waste Agreement and management programs and plans. A discussion of requirements and results is provided in **Section 3**.

The compliance status of each requirement or commitment was determined according to the definitions in the *Post Approval Requirements for State Significant Development, Independent Audit Guideline* (NSW Government, 2015). This guideline provides definitions for 'compliant', 'non-compliant', 'administrative non-compliance', 'not verified', 'not triggered', 'observation', and 'noted'.

A summary of non-compliances and not verified conditions for the reviewed conditions is provided in **Section 5.** Recommendations or Opportunity for Improvement (OFI) comments are also included in **Section 5**.

1.5.2 Reviewed Reports

To assist in the preparation of this Annual Review, the following documents have been reviewed during the reporting period:

- Whytes Gully Landfill Annual Report 2017-2018 (Cardno, 2018) (**Appendix C**).
- Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot) - Annual Report 29 may 2016 – 28 May 2017 (Wollongong City Council, 2017) (**Appendix C**).
- Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot) - Annual Report 29 May 2015 – 28 May 2016 (Wollongong City Council, 2016) (**Appendix C**).
- Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot) - Annual Report 29 May 2014 – 28 May 2015 (Wollongong City Council, 2015) (**Appendix C**).
- Whytes Gully Waste Disposal Facility – Annual Report 01 June 2013 – 31 May 2014 (Wollongong City Council, 2014) (**Appendix C**).
- Whytes Gully Waste Disposal Facility – Annual Report 01 June 2012 – 31 May 2013 (Wollongong City Council, 2013) (**Appendix C**).
- Independent Environmental Audit – Whytes Gully Landfill Extension Project (MCW Environmental Consulting, 2018) (**Appendix D**).

1.5.3 Meetings Attended

The following meetings were conducted to assist with the preparation of this document:

- 2 August 2018 with Cardno staff, WCC's Waste & Resource Recovery Manager, and WCC's WHS Quality Environmental Officer at Whytes Gully Waste and Resource Park.
- 10 August 2018 with Cardno staff, WCC's Waste & Resource Recovery Manager, and WCC's WHS Quality Environmental Officer at Whytes Gully Waste and Resource Park.

Cardno attempted to contact the NSW Department of Planning and Environment by phone several times over a two-month period with the objective of obtaining guidance on the reporting requirements of the Annual Review. Each attempt was unsuccessful and as such the Annual Review was prepared in accordance with Cardno's interpretation of the requirement.

2 Site construction and operation

In accordance with Condition 5(a) of Schedule 5 of the Project Approval, this section provides a description of the operations that were carried out in the reporting period.

2.1 Approved Works

As part of the staged new landfill cell that would create approximately 7 million cubic metres of additional landfill capacity, the following key components were approved:

- New landfill cell construction (Stage 1A, 1B, 2A, 2B, 3 and 4).
- New landfill cell operation (Stage 1A, 1B, 2A, 2B, 3 and 4).
- Progressive landfill rehabilitation and revegetation of the finished landform.
- Surface water drains and surface water ponds.
- Leachate management infrastructure and ponds.
- Landfill gas extraction and flaring.
- Demolition of existing buildings, construction of temporary and permanent roads.

2.2 Construction works completed to Date

Following project approval, works on the new land fill cell commenced in 2013. Cell 1A was completed in 2014 and waste placement commenced around March 2015. WCC has since constructed Cell 1B and has commenced filling. Cell 2 is currently under construction. The location of each cell and significant site features are shown on **Figure 2** of **Appendix F**.

The second section / stage of the eastern gully is situated immediately west of the first stage, with extended leachate drains and a HDPE liner. From 2014 to 2016, the eastern gully underwent extensive surface reshaping works in order to reduce rainwater infiltration, increase surface water diversion, to ensure consistent cover depths and to prepare the surface for the new landfill cell base liner.

Construction of the Stage 2 package of works commenced in March 2017, which included construction of two separate lined landfill cells comprising:

- Demolition of roads, drainage infrastructure and minor structures.
- A new haul road to facilitate operational traffic movements (completed early 2017).
- Bulk earthworks, including vegetation removal.
- Installation of new leachate collection infrastructure, including sumps, pipework and a new leachate storage pond.
- New landfill gas management infrastructure to collect and drain landfill gas to the existing landfill gas management system.
- New stormwater infrastructure to divert clean surface water runoff from the new landfill cells.
- New landfill lining systems to place waste collected from the LGA.

Construction of Stage 2 works was completed in early 2019, and begun accepting waste in January 2019.

2.3 Operational activities

Operation of the Stage 1 Cell commenced in 2014 and was approximately 70% filled at the time of this Annual Review. Construction of the Stage 2 Cell commenced in 2017 and new leachate storage pond. Construction of the first new lined landfill cell and has been accepting waste since January 2019.

3 Environmental Monitoring

In accordance with Condition 5(b) of Schedule 5 of the Project Approval, this section provides analysis of the monitoring results for the project over the reporting period. In addition, this section provides a comparison of these results against the relevant statutory requirements, limits or performance measures/criteria, and the relevant predictions provided in the EA (Golder, 2012). In addition, trend identification for monitoring data over the life of the project has been discussed for each environmental component in accordance with Condition 5(d) of Schedule 5 of the Project Approval.

3.1 Waste

3.1.1 Criteria

3.1.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for waste management is Schedule 4 Conditions 1 to 13, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following monitoring criteria for waste have been established by the Project Approval:

> Schedule 3 Condition 5:
  - WCC shall ensure that no more than 180,000 tonnes per annum (tpa) of waste is accepted at the landfill in any calendar year.
> Schedule 4 Condition 1:
  - WCC shall only receive waste on site that is authorised for receipt by an EPL.
> Schedule 4 Condition 5:
  - As part of the Waste and Resource Recovery Monitoring Program, WCC must monitor the quantity, type and source of waste received on site.

'Wasteman' program is used to track incoming and outgoing wastes at the site. WCC reports tonnage received by the site to the EPA on a monthly bases as per the WCC's EPL.

3.1.1.2 EPL 5862

The following criteria for waste have been established by EPL 5862:

> Condition L3.1 of the EPL 5862 outlines the following waste as acceptable at the site:
  - Tyres
  - General solid waste (non-putrescible).
  - General solid waste (putrescible).
  - Asbestos waste.
> Condition 3 (L3.2) of EPL 5862 states that the licensee must not dispose of any tyres on the premises which:
  - Have a diameter of less than 1.2 metres.
  - Are delivered at the premises in a load containing more than 5 whole tyres.
  - Became waste in the Sydney Metropolitan Area.
> Condition 3 (L3.3) states that tyres stockpiled on the premises must:
  - Not exceed fifty tonnes of tyre at one time.
  - Be located in a clearly defined area away from the tipping face.
  - Be managed to control vermin.
  - Be managed to prevent any tyres from catching fire.

'Wasteman' program is used to track incoming and outgoing wastes at the site. WCC reports tonnage received by the site to the EPA on a monthly basis as per the WCC's EPL.

Waste tyres are received at the Site from public drop off and from WCC's On Call Household Cleanup service. All tyres received at the Site are temporarily stored in a steel bin and subsequently removed for off-site recycling by a tyre recycling contractor (Tyrecycle Pty Ltd). Waste tyres are not disposed of or buried at the Site.

WCC display a NSW EPA Fixed QR2id Plate on the inbound weighbridge to enable inbound vehicles disposing waste tyres to exchange information regarding their load to the EPA under Clause 76 of the Waste Regulation. Any vehicles that fail to scan the QR2id plate at the entry to the landfill are reported by WCC to the Waste Operations division of the EPA on a monthly basis (no later than 7 days following the end of each month).

WCC follow a procedure (Procedure – Reporting un scanned inbound waste tyres to EPA, TRIM No. Z16/175510) developed to manage waste tyres in a manner that satisfies their obligations under the POEO (Waste) Regulation 2014. The procedure was prepared in consideration of the Asbestos and Waste Tyre Guidelines (EPA 2015).

3.1.1.3 Monitoring Plans

According to the LEMP, the following monitoring activities are required at the site:

- Site survey twice per year (June, December) (Section 5.3 of LEMP).
- Weighbridge certification, once per year (December) (Section 5.3 of LEMP).
- Six monthly review of compaction data (Section 6.4 of LEMP).

3.1.1.4 EA Predictions

Waste tonnage data adopted for modelling were based on the average annual weighbridge data for the years 2009 to 2011. As part of this data, Municipal (MSW), and Commercial & Industrial (C&I) waste stream data was used for NGER Solid Waste Emissions calculations (Golder Associates, 2012).

Approximately 120,000 to 150,000 tpa of total waste received at WWARRP were received for the years of 2008 to 2012. This amount included waste to landfill, materials recovery facility (MRF), green waste processing and other resource recovery not including cover material. While WWARRP has previously accepted material tonnage to landfill in excess of 180,000 tpa, it was proposed that the annual waste accepted to landfill at the site would not increase from the existing operation at the site.

3.1.2 Results

The tpa received per calendar year since commencement of the project is provided in **Table 3-1** below.

Table 3-1 Waste received at the Site

Calendar year	Tonnage per annum (tpa)	Waste Streams		
		General solid waste (non-putrescible)	General solid waste (putrescible)	Asbestos waste
2012/2013	90,083.17	36,207.36	53,875.81	-
2013/2014	88,566.07	33,782.92	54,783.15	-
2014/2015	86,851.78	31,951.52	54,900.26	-
2015/2016	77,388.76	20,107.14	57,281.62	-
2016/2017	90,367.26	34,227.98	56,139.28	-
2017/2018	82,969.92	27,890.56	55,079.36	-

3.1.3 Analysis

3.1.3.1 Comparison against statutory requirements, limits or performance measures/criteria

WCC confirmed that the site is compliant with the EPL requirements regarding waste streams and only receives waste that is authorised under the EPL. WCC employees who operate excavators and compactors at the tip face are trained to identify materials that are not acceptable at the landfill, and a camera has been installed at the weighbridge check point to ensure the wastes accepted are in accordance with the EPL requirements.

The total tonnage per year for this reporting period is below the waste limit of 180,000 tpa as defined in the Project Approval Schedule 3 Condition 5.

The monitoring requirements as required by the LEMP are not currently undertaken, and have been noted in **Section 5** of this document.

3.1.3.2 Comparison against relevant EA predictions

The total tonnage for this reporting period was less than the maximum permissible tonnage of 180,000 tpa.

3.1.4 Trend Identification

The total tonnage per year has been provided in the Annual Review for calendar years since the commencement of this project, and all annual tonnages are below the permissible thresholds as shown in **Table 3-1**.

3.2 Surface Water

3.2.1 Criteria

3.2.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for soil and water management is Schedule 4 Conditions 14 to 22, and a review of the site's compliance with these conditions is provided in **Appendix A**.

The following criteria for surface water have been established by the Project Approval:

- Schedule 4 Condition 14:
  - WCC shall ensure that all licensed surface water discharges from the site comply with the discharge limits (volume and quality) set for the project in any EPL or relevant provision of the POEO Act.
- Schedule 4 Condition 15c:
  - WCC shall ensure that peak stormwater discharge rates from the site at each stage of the project do not exceed pre-development values.
- Schedule 4 Condition 18e (Modification 2):
  - WCC shall undertake on-going surface water, groundwater and leachate monitoring program that includes (but is not limited to):
    - Baseline data.
    - A combined surface and groundwater monitoring program to gain an understanding of surface and groundwater interaction and the potential for any impacts of the project on the downstream environment include GDEs and Dapto Creek.
    - Surface and groundwater impact assessment criteria including trigger levels for investigating adverse impacts.
    - A Mitigation Plan detailing the remedial actions to be implemented address potential impacts on the downstream environment from surface or groundwater contamination associated with the project and/or in the event of exceedances of the surface and/or groundwater impact assessment criteria.

The requirements of the current EPL 5862 for surface water are considered to supersede the conditions provided in the Project Approval.

3.2.1.2 EPL 5862

In accordance with Section 3 (L1.2) of EPL 5862 the performance criteria for stormwater was no discharge of contaminated stormwater to waters under dry weather conditions (less than 10mm of rainfall within a 24hr period) or a storm event/s of less than 1:10 year, 24-hour recurrence interval (less than 297.4 mm of rainfall within a 24 hour time period).

The contaminants and parameters applicable to stormwater samples are provided in Section 5 (M2.3)

In addition, and in accordance with Section 3 (L2) of EPL 5862, the performance criteria for the stormwater monitoring and discharge point at Reddalls Road, known as Monitoring Point 1, include:

- pH: a 100 percentile concentration limit of 6.5 to 8.5
- Total Suspended Solids: a 100 percentile concentration limit of 50 mg/L

In accordance with Section 3 (L1.3) of EPL 5862 the limit for leachate was no discharge of leachate to waters under dry weather conditions (less than 10mm of rainfall within a 24hr period) or a storm event/s of less than the 1:25 Average Return Interval (ARI), 24-hour recurrence interval (less than 371.5 mm of rainfall within a 24 hour time period). The performance criteria adopted for leachate discharges was based on records regarding the timing and nature of leachate discharges during the reporting period.

3.2.1.3 Management Plans

The frequency of monitoring and analytical suite prescribed by the NSW EPA in EPL 5862 (2017) supersedes the monitoring program provided in Section 7.3 of the LEMP and is considered suitable to assess the effectiveness of the leachate barrier system.

The management measures provided in the LEMP (2014) were developed in consideration of the *NSW Environmental Guidelines: Solid Waste Landfills* (EPA, 1996) and also addressed the monitoring and reporting requirements of EPL 5862 at the time of reporting. The *NSW Environmental Guidelines: Solid Waste Landfills* (EPA 1996) were replaced with the *Environmental Guidelines: Solid Waste Landfills, Second edition* (EPA, 2016). As such WCC are updating the site LEMP to ensure compliance with current legislative requirements.

3.2.1.4 EA Predictions

The EA did not provide any predictions for surface water.

Section 12.5.2 of the EA predicted that the existing leachate ponds are expected to have sufficient capacity to store leachate generated during two consecutive wet years. The modelled leachate volumes (based on 90th percentile monthly rainfall) indicate that within the 2-year period, the maximum leachate requiring storage (15 200 kL/month) occurs during the second year of the project (month 15) and the maximum cumulative volume of leachate requiring storage (18 000 kL) occurs during the third month of the project (month 3). The maximum capacity is noted to be approximately 18 000 kL.

3.2.2 Results

Surface water / stormwater monitoring data was gathered in accordance with EPL 5862 during the reporting period from the 29th of May 2017 to the 28th of May 2018. The results and interpretation were compiled into an *Annual Report* (Cardno 2018) that was submitted to the NSW EPA in accordance with the conditions of EPL 5862. A copy of tabulated analytical result summary tables is provided in Appendix B of the 2017-2018 Annual Report (see **Appendix C**). A summary of the results is provided below:

- Controlled releases of uncontaminated stormwater occurred on ten (10) occasions during the reporting period with standing water level, turbidity and pH measured and validated prior to each release.
- pH and turbidity were measured using a water quality meter prior to each release and samples of stormwater were collected and submitted for laboratory analysis of TSS on four occasions to validate the accuracy of field turbidity measurements. Prior to each release pH was measured between 6.5 to 8.5 and TSS was below the 50 mg/L, enabling the water to be discharged.
- Stormwater monitoring results from the annual sampling event are summarised in Table 4 of Appendix B of the *Annual Report* (Cardno 2018) (see **Appendix C**) with the pertinent findings provided below:
- Ammonia was reported at a concentration of 1.82 mg/L in the stormwater sample collected from Point 33, above the ANZECC 90% protection trigger level of 1.43 mg/L. Ammonia was reported below the performance criteria in all other samples.

- The highest reported concentration of TSS was 76 mg/L in the stormwater sample collected from Point 33. The TSS concentration of Point 1 was 16 mg/L, below the EPL limit specific to Point 1 of 50 mg/L.
- A pH of 9.7 was reported in the stormwater sample collected from Point 1, outside of the acceptable pH range from the EPL of 6.5 to 8.5.

3.2.3 Analysis

3.2.3.1 Comparison against statutory requirements, limits or performance measures/criteria

No uncontrolled releases of contaminated stormwater occurred during the reporting period under dry weather or storm events. As such non-conformances of the EPL did not occur with respect to releases of stormwater.

A pH of 9.7 was measured at Point 1 at the time of sample collection during the annual monitoring event, which is outside of the acceptable range of 6.5 to 8.5 provided in EPL 5862. The pH at Points 33 and 34 were 7.5 and 7.6, respectively, substantially below that measured at Point 1 and within the neutral range. The elevated pH at Point 1 correlates with high concentrations of alkalinity (carbonate as calcium carbonate), chloride, sodium and sulfate when compared with that of Points 33 and 34.

An elevated concentration of ammonia was reported in the sample collected from Point 33, exceeding the ANZECC 90% protection limit. Points 1 and 34 were significantly lower with concentrations marginally above the laboratory LOR. Point 33 is located in an adjoining property to the south and the sample was collected from a surface water body approximately 150 m south west of the Site boundary. The elevated ammonia concentration at this location may indicate potential interaction with leachate originating at the Site through groundwater discharging into the surface water body or from a release of leachate from storage ponds.

Reddalls Road is a public road that is frequently utilised by vehicles associated with local heavy industry. The road passes between the Site boundary and Points 1 and 33 and it is inferred that surface water runoff from Reddalls Road would flow to each monitoring point. It is also noted that monitoring Points 1 and 33 were stagnant at the time of sampling and that releases of stormwater and leachate did not occur during the reporting period, therefore opportunities for leachate interaction at these locations is limited. These factors are further discussed in the recommendations in the EPL Annual Report (Cardno 2018), see **Appendix C**.

With respect to the Project Approval Schedule 4 Condition 15c, the Independent Auditor confirmed that site surveillance reports did not report any overflow of the sediment pond.

3.2.3.2 Comparison against relevant EA predictions

Surface water management during the 2017-2018 reporting period was managed in a manner that did not result in non-conformances of the EA predictions.

3.2.4 Trend Identification

A series of graphs showing trends in stormwater / surface water contaminant and parameter levels are provided in Appendix D of the 2017-2018 EPL Annual Report (see **Appendix C**) and are discussed below.

- The pH of Point 1 increased sharply from last reporting period from 7.7 to 9.7 as shown on Sheet 1D. The pH at Point 1 has historically ranged from 7.1 to 8.0 in the previous three years with the measurement of 9.7 the highest pH recorded at this location. The pH of Point 33 and 34 remained relatively stable.
- TSS at Point 33 showed an upward trend from the previous year but remained within the typical range during the previous three years.
- The remainder of contaminants and parameters did not deviate significantly from the concentrations reported during the previous three years.

3.3 Groundwater

3.3.1 Criteria

3.3.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for soil and water management is Schedule 4 Conditions 14 to 22, and a review of the site's compliance with these conditions is provided in **Appendix A**.

The requirements of the current EPL 5862 for groundwater are considered to supersede the conditions provided in the Project Approval.

3.3.1.2 EPL 5862

The selected performance criteria for groundwater samples were based on the recommendations of the *Environmental Guidelines* (EPA 2016) and in consideration of the land use, site setting and the plausible interactions between potential contaminants and human and environmental receptors.

The Environmental Guidelines (EPA 2016) recommend screening groundwater analytical results against the *National Environment Protection (Assessment of Site Contamination) Measure* (National Environment Protection Council, 2013), specifically:

> Schedule B1, Table 1C Groundwater Investigation Levels, which summarises trigger values from:

- *Australian Water Quality Guidelines* (ANZECC 2000):

  The results were screened against the criteria for 80%, 90% and 95% species protection trigger levels, which refers to the percentage of species expected to be protected. A brief overview of each protection level is provided below:

  - The 80% protection level trigger values apply to ecosystems that are highly disturbed with limited conservation value;
  - The 90% protection level trigger values apply to ecosystems that are moderately disturbed with low conservation value; and
  - The 95% protection level trigger values apply to ecosystems that are slightly to moderately disturbed with a moderate conservation value.

  Each protection trigger level was applied to groundwater data gathered during the reporting period, however, given the high level of disturbance at the site and the predominantly industrial surrounding land use the 90% levels are considered most appropriate to adopt as a performance criteria.

- *Australian Drinking Water Guidelines* (National Health and Medical Research Council and the Natural Resource Management Ministerial Council, 2011, updated 2014) (ADWG).

Surface water and groundwater is not utilised for human consumption at the Site, however, it is plausible that groundwater is used for agricultural (irrigation and stock watering). As such the ADWG were adopted.

> Schedule B1, Table 1A (4) Health Screening Levels groundwater for petroleum hydrocarbons.

3.3.1.3 Management Plans

The LEMP (Golder 2014) specifies a requirement for monitoring and assessment of groundwater conditions at and surrounding the site to confirm that the leachate barrier system is providing a physical barrier to leachate migration into natural waters. The objective of monitoring is to determine if groundwater and surface water are affected by potential interaction with leachate.

Section 7 of the LEMP summarises the Inspection Monitoring and Maintenance Schedule for the leachate collection system, which includes regular monitoring during construction, routine inspections of pumps and ponds, maintenance and groundwater and surface water monitoring. The groundwater monitoring requirements are provided in Section 7.3 of the LEMP, which includes establishment of a monitoring network (i.e. bores) a groundwater monitoring program and annual review of water monitoring data in accordance with the requirements of EPL 5862, issued by the NSW Environment Protection Authority under the POEO Act.

The current EPL at the time of preparation of this document was issued by the NSW EPA on the 5th of July 2017 and specifies a groundwater monitoring program that differs to the program described in the LEMP. Four groundwater monitoring bores were decommissioned on the 23rd of February 2017 and have been removed from the current EPL, including bore 2 (GABH01), bore 6 (GABH03), bore 7 (GABH06D) and bore 8 (GABH06S). It is also noted that monitoring bore 13 (GMW106) has been reported as dry since 2013 but is still included in the current EPL groundwater monitoring program.

The frequency of monitoring and analytical suite prescribed by the NSW EPA in EPL 5862 (2017) supersedes the monitoring program provided in Section 7.3 of the LEMP and is considered suitable to assess the effectiveness of the leachate barrier system.

The management measures provided in the LEMP (2014) were developed in consideration of the *NSW Environmental Guidelines: Solid Waste Landfills* (EPA, 1996) and also addressed the monitoring and

reporting requirements of EPL 5862 at the time of reporting. The *NSW Environmental Guidelines: Solid Waste Landfills* (EPA 1996) were replaced with the *Environmental Guidelines: Solid Waste Landfills, Second edition* (EPA, 2016). As such WCC are updating the site LEMP to ensure compliance with current legislative requirements.

3.3.1.4 EA Predictions

Section 12.2.2. of the EA predicted that the potential for leachate infiltration to groundwater from the landfill would be controlled by the permeability of the liner. The EA states that the hydrogeological setting (upward hydraulic gradient, relatively low permeability formations, limited water supply development and no high-value GDEs in the vicinity of the site of the landfill) is conducive to landfilling operations and would appear to represent a relatively low risk in the event of a leachate release to groundwater.

3.3.2 Results

Groundwater monitoring data was gathered in accordance with EPL 5862 during the reporting period from the 29th of May 2017 to the 28th of May 2018. The results and interpretation were compiled into an *Annual Report* (Cardno 2018) that was submitted to the NSW EPA in accordance with the conditions of EPL 5862. A copy of tabulated analytical result summary tables is provided in Appendix B of the 2017-2018 Annual Report (see **Appendix C**). A summary of the results is provided below:

- Groundwater levels measured at the site during the 2017-2018 reporting period ranged from 1.65m below ground level (bgl) in groundwater monitoring Point 20 (BH6) to 11.7m bgl in groundwater monitoring point 12 (GMW105).
- Benzene, toluene, ethylbenzene and xylenes (BTEX) and TPH were not detected above the laboratory limits of reporting (LORs) in any groundwater sample collected during the reporting period.
- PAH was not detected above the laboratory LORs in any sample, however, it is noted that the adopted criteria for anthracene and benzo(a)pyrene were below the laboratory limit of reporting. Therefore, the results of anthracene and benzo(a)pyrene cannot be screened against the criteria, which is further discussed in EPL Annual Report (Cardno 2018), see **Appendix C**.
- Aluminium (total) concentrations ranged from 0.21mg/L in monitoring point 19 to 229 mg/L in point 11, with all samples containing aluminium above the ANZECC 90% protection trigger level of 0.08 mg/L. The dissolved concentration of aluminium in point 11 was 0.44 mg/L and in point 16 was 0.42 mg/L, also above the ANZECC 90% trigger level.
- Arsenic, barium and mercury were below reported at concentrations below the adopted performance criteria for all samples.
- Cadmium (total) concentrations ranged from below the laboratory limit of reporting (multiple samples) to 0.0006 mg/L in monitoring point 11. The concentration recorded for point 11 is above the ANZECC 90% protection trigger level of 0.0004 mg/L but below the ADWG criteria of 0.002 mg/L. Dissolved cadmium was below the laboratory LOR in point 11.
- Chromium (hexavalent) was not detected above the laboratory limit of reporting in all groundwater samples collected during the reporting period, however, it is noted that the adopted criteria is below the laboratory limit of reporting. Therefore, the results cannot be screened against the performance criteria, which is further discussed in EPL Annual Report (Cardno 2018), see **Appendix C**.
- Copper (total) concentrations ranged from 0.002 mg/L (multiple samples) to 0.32 mg/L (point 11) with all results above the ANZECC 90% protection trigger level of 0.0018 mg/L but below the ADWG criteria of 2 mg/L. Dissolved copper was below the laboratory LOR for point 11 and 0.003 mg/L, above the ANZECC 90% protection trigger level but below the ADWG criteria.
- Lead (total) concentrations ranged from below the laboratory limit of reporting (point 15) to 0.32 mg/L (point 11) with all results above the ANZECC 90% protection trigger level of 0.0018 mg/L but below the ADWG criteria of 2 mg/L. Dissolved lead was below the laboratory LOR for point 11 and point 16.
- Manganese (total) concentrations ranged from 0.021 (point 15) to 7.15 mg/L (point 11) with seven samples above the ANZECC 90% protection trigger level of 2.5 mg/L and nine samples above the ADWG criteria of 0.5 mg/L. Dissolved manganese was 0.415 mg/L in point 11 and 3.19 mg/L in point 16, above the ANZECC 90% protection trigger level.
- Nickel (total) concentrations ranged from 0.028 (point 16) to 0.88 mg/L (point 11) with seven samples above the ANZECC 90% protection trigger level of 0.013 mg/L. Dissolved nickel was 0.002 mg/L in point 11 and 0.009 mg/L in point 16, below the criteria.

- Zinc (total) concentrations ranged from 0.01 mg/L (multiple samples) to 0.61 mg/L (point 11) with fifteen samples above the ANZECC 90% protection trigger level of 0.015 mg/L. Dissolved zinc was below the laboratory LOR in point 11 and 0.022 in point 16, above the ANZECC 90% trigger level.
- Specific trigger values were not provided in the adopted performance criteria for calcium, cobalt, magnesium and potassium.
- Ammonia concentrations ranged from below the laboratory limit of reporting (multiple samples) to 0.82 mg/L in point 16, with all samples below the adopted performance criteria.
- Fluoride concentrations ranged from 0.1 mg/L (point 16) to 0.9 mg/L in point 20, with all samples below the adopted performance criteria.
- Nitrate concentrations ranged from 0.01 mg/L (point 14) to 0.52 mg/L in point 17, with all samples below the adopted performance criteria.
- Specific trigger values were not provided in the adopted performance criteria for alkalinity, chloride, nitrite, sodium, TDS, TOC and sulfate.
- OCP contaminants aldrin and dieldrin, chlordane, dichlorodiphenyltrichloroethane (DDT), endrin, lindane and heptachlor were not detected above the laboratory limit of reporting in any sample, however, it is noted that the adopted criteria were below the laboratory limit of reporting. Therefore, the results cannot be screened against the criteria, which is further discussed in EPL Annual Report (Cardno 2018), see **Appendix C**.
- OPP contaminants azinophos methyl, chlorpyrifos, diazinon, dimethoate, malathion, methyl parathion and parathion were not detected above the laboratory limit of reporting in any sample, however, it is noted that the adopted criteria were below the laboratory limit of reporting. Therefore, the results cannot be screened against the criteria, which is further discussed in EPL Annual Report (Cardno 2018), see **Appendix C**.
- Bromophos-ethyl, carbophenothion, chlorfenvinphos, dichlorvos, ethion, fenthion, fethyl parathion, monocrotophos, fenamiphos and pirimphos-ethyl were not detected above the laboratory limit of reporting and were therefore below the adopted performance criteria.
- Electrical conductivity ranged from 354 µS/cm (point 9) to 5,730 µS/cm (point 5).
- pH ranged from 5.8 (point 12) to 7.5 (point 11).
- Total organic carbon ranged from 8 mg/L (point 5) to 9 mg/L (point 20).

3.3.3 Analysis

3.3.3.1 Comparison against statutory requirements, limits or performance measures/criteria

Groundwater Levels

Interpretation of groundwater levels across the site from the 2017-2018 reporting period indicate that the inferred groundwater flow direction is from the north east to the south west, which is consistent with the local topography. Groundwater is situated at the greatest depths in the higher elevations of the site toward the north eastern corner and is shallowest in the south eastern boundary in close proximity to the nearest surface water body, Dapto Creek.

It is noted that groundwater monitoring points 9, 12 and 13 were dry during the February 2018 monitoring event. These wells are located in the higher elevations of the site along the northern and western boundary. Climatic data from the Albion Park weather station summarised in Table 2-1 indicates that 49.8mm of rain fell in December and 56.0mm in January, down from the long-term averages of 67.0mm and 72.9mm, respectively. Consequently the wells that were dry during the February monitoring event were unable to be sampled and analysed for the ‘yearly’ contaminants listed in table M2.3 of the EPL.

Groundwater Analytical Results

Groundwater analysis completed during the reporting period showed that the majority of contaminants and parameters of interest specified in EPL 5862 were below the laboratory LORs or the performance criteria, including BTEX, TPH, PAH, ammonia, fluoride and nitrate.

Performance criteria are not provided for alkalinity, chloride, nitrite, sodium, TDS, TOC and sulfate however the results were generally comparable with historical data and are not considered unusual or concerning in the context of the Site and surrounding land use. EPA monitoring points 5, 17, 18 and 20 are located in the

lower elevations of the Site toward the western and southern western boundary and generally had the highest concentrations. EPA monitoring points 9, 10, 12 and 13 generally contained the lowest levels of the parameters, with the wells located in the higher elevations toward the northern and eastern boundary. This indicates that wells situated down gradient of buried waste have the relatively higher concentrations.

Numerous heavy metal concentrations were reported above the adopted performance criteria during the reporting period including aluminium, cadmium, copper, lead, manganese, nickel and zinc. The concentrations reported were for total metals in accordance with the EPL requirement, however, it is important to note that the adopted screening criteria recommended by the *Environmental Guidelines* (EPA 2016) are intended for application to concentrations of dissolved metals. As such the exceedances are not necessarily indicative of environmental concern with the contaminant concentrations most likely attributed to the presence of sediment in unfiltered samples. Monitoring Points 11 and 16 typically had the highest concentrations of total metals and samples from both locations were analysed for both total and dissolved metals on during the September monitoring event. The results show that that dissolved heavy metal concentrations were significantly lower than total metals, with exceedances of the adopted criteria generally limited to aluminium, copper, manganese and zinc in Point 16.

3.3.3.2 Comparison against relevant EA predictions

The analytical results from the 2017-2018 reporting period generally show that the predictions of the EA have been satisfied. Some exceedances of the adopted criteria were reported but are not necessarily attributed to leachate infiltration into groundwater. The analytical data collected in the 2018-2019 reporting period will assist in confirming groundwater quality assuming the recommendations provided in EPL Annual Report (Cardno 2018), see **Appendix C**.

3.3.4 Trend Identification

Groundwater Levels

Groundwater levels have remained relatively stable over the previous three years with the exception of EPA monitoring points 5, 9, 12 and 13.

The groundwater depth recorded in monitoring point 5 during the May 2017 monitoring event was 10.65 meters below ground level (mbgl), significantly deeper than historical groundwater depths recorded (typically around 5 mbgl). Monitoring point 5 is situated in the lower lying portion of the Site toward the western boundary. The groundwater levels remained stable during the 2017/2018 reporting period and the unusual groundwater depth of 10.65 mgbl recorded in 2017 is considered an anomaly or a reporting error by ALS Environmental, with subsequent depths returning normal values.

The groundwater depth in monitoring point 9 has historically fluctuated between 1.95 to 11.68 mbgl but had never been recorded as dry. Monitoring point 9 is situated at a relatively high elevation and is located along the northern boundary of the Site. The well was recorded as dry during the February 2018 monitoring event and may be a consequence of dry weather conditions prior to the sampling event.

The groundwater depth in monitoring point 12 has historically remained relatively stable fluctuating between 10 to 12 mbgl, but had never been recorded as dry. Monitoring point 12 is situated at a relatively high elevation and is located along the eastern boundary of the Site. The well was recorded as dry during the February 2018 monitoring event and may be a consequence of dry weather conditions prior to the sampling event.

Monitoring point 13 was recorded as dry during the reporting period which is consistent with historical records. Monitoring point 12 is situated at a relatively high elevation and is located along the eastern boundary of the Site.

Groundwater Analytical Testing

A trend graph and discussion has not been provided for OCP, OPP, PAH, BTEXN or Phenolics as these contaminants have never been reported above the laboratory limit of reporting.

A series of graphs showing trends in groundwater contaminant and parameter levels for annual and quarterly monitoring are provided in Appendix D of the 2017-2018 Annual Return (Cardno 2018) (see **Appendix C**), and are discussed below.

The trend graphs from groundwater monitoring event shows that contaminant and parameter concentrations have remained steady and relatively consistent with the three years prior, with a general decline in contaminant concentrations. It is noted that several monitoring wells were dry during the annual monitoring event and therefore trend analysis was unable to be completed for the entire well network.

3.4 Trade Wastewater

3.4.1 Criteria

3.4.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for soil and water management is Schedule 4 Conditions 14 to 22, and a review of the site's compliance with these conditions is provided in **Appendix A.**

Schedule 4 Condition 6 of the Project Approval states that WCC shall ensure that a Trade Waste Agreement is in place with Sydney Water for as long as leachate is discharged to sewer.

3.4.1.2 Consent to Discharge Industrial Trade Wastewater

Discharge of trade waste to sewer is undertaken in accordance with the *Consent to Discharge Industrial Trade Wastewater* (Sydney Water, 2017). The *Consent* provides criteria for a variety of parameters for the long term average daily mass (LTADM) and the maximum daily mass (MDM). In addition to analytical performance criteria the *Consent* provides limits for aesthetic properties of trade wastewater including temperature, colour, pH, fibrous materials, gross solids and flammability, and limits to the rate of discharge of wastewater to sewer.

3.4.1.3 EA Predictions

There were no predictions in the EA regarding trade wastewater.

3.4.2 Results

Monitoring of trade waste was completed periodically during the reporting period to assess waste water discharge and confirm that water quality parameters were within the acceptable criteria. Discharge of trade waste to sewer was undertaken in accordance with the *Consent to Discharge Industrial Trade Wastewater* (Sydney Water 2017).

Trade wastewater monitoring was undertaken 18 times during the 2017-2018 reporting period. The results of monitoring showed that on each occasion volume discharge, total dissolved solids, suspended solids, ammonia as N, biochemical oxygen demand and temperature were within the acceptable criteria provided in the *Consent* (Sydney Water, 2017).

pH was measured at the commencement and completion of each monitoring event and a non-conformance with the Sydney Water criteria was recorded on the 17th of August 2017. A pH of 6.5 was recorded at commencement and completion of monitoring, which is outside of the acceptable criteria of 7 to 10.

3.4.3 Analysis

3.4.3.1 Comparison against statutory requirements, limits or performance measures/criteria

Trade wastewater was discharged into the sewer network in accordance with the *Consent* (Sydney Water 2017) with only one non-conformance recorded during the reporting period. A pH of 6.5 was measured at the commencement and completion of monitoring during the event on the 17th of August 2017, below the lower limit of 7.

The pH of 6.5 was attributed to damage to the leachate line during construction of a new leachate pond with the civil earthworks contractor, Ertech, striking the leachate line. Process and Operations Engineers from INNACO indicated that the low pH was most likely a consequence of damage to the leachate line.

pH measurements during the monitoring events prior to and after the 17th of August monitoring event were between 7.7 and 10 (within the acceptable criteria), indicating that the non-conformance of pH was an isolated occurrence and the repairs to the leachate line effectively mitigated the issue. All other trade waste monitoring was compliant with the requirements of the Consent, therefore rendering the waste suitable to be discharged to the Sydney water sewer network.

3.4.3.2 Comparison against relevant EA predictions

There were no predictions in the EA regarding trade wastewater.

3.4.4 Trend Identification

The results of trade wastewater monitoring from the 2017-2018 reporting period were slightly better than the year prior with only one monitoring event where pH was measured outside of the acceptable limit. This compares with two non-conformances during the 2016-2017 for pH and one for ammonia. Prior to 2016 non-conformances relating to pH and ammonia were more frequent, which indicates that the monitoring data is improving over time.

3.5 Weather

3.5.1 Criteria

3.5.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for air quality management is Schedule 4 Conditions 23 to 30, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following criteria for air quality have been established by the Project Approval:

> Schedule 4 Condition 28:

- WCC shall install and operate a meteorological weather monitoring station on the site for the life of the project that complies with the requirements in the latest version of the EPA's Approved Methods for Sampling of Air Pollutants in New South Wales guideline. The meteorological station must be maintained so as to be capable of continuously monitoring the following parameters: air temperature, wind direction, wind speed, rainfall and relative humidity.

3.5.1.2 EA Predictions

There were no predictions in the EA relating to weather observations at the site (other than dust and odour, which are discussed in **Section 3.6** and **Section 3.7**).

3.5.2 Results

WCC confirmed that a meteorological station (Davis Vantage Pro 2) has been set up at the site and is maintained routinely. However, results from this station have not been sighted by Cardno and have not been included in this report.

Table 3-2 provides a total of rainfall for each month during the reporting period recorded by the rainfall gauge at the site rainfall gauge, and from the Albion Park (Wollongong Airport) Bureau of Meteorology weather station (ID: 068241). **Table 3-2** also provides the total monthly average rainfall from the Albion Park weather station. The Albion Park weather station is located approximately 11kilometres from the site.

The total monthly rainfall recorded at the site has been lower than the total monthly average rainfall from Albion Park weather station, with the exception of a slightly higher total monthly rainfall from the site than the Albion Park weather station for June 2018.

Table 3-2 Rainfall data for the reporting period

Month	Total monthly rainfall from site rainfall gauge	Total monthly rainfall from Albion Park weather station	Total monthly average rainfall from Albion Park weather station
April 2018	8.8 mm	18.2 mm	73.8 mm
May 2018	NR	12.8 mm	55.8 mm
June 2018	NR	79.6 mm	93.7 mm
July 2018	NR	4.6 mm	49.0 mm
August 2018	19.8 mm	19.0 mm	53.5 mm

Notes: NR - Not recorded during the month

3.5.3 Analysis

3.5.3.1 Comparison against statutory requirements, limits or performance measures/criteria

No meteorological data has been sighted by Cardno, however the Independent Environmental Audit confirmed that data is being recorded and meets the requirements of Condition 28 of Schedule 4 of the Project Approval.

3.5.3.2 Comparison against relevant EA predictions

There were no predictions in the EA relating to weather observations at the site (other than dust and odour, which are discussed in **Section 3.6** and **Section 3.7**).

3.5.4 Trend Identification

No meteorological data has been sighted by Cardno, however the Independent Environmental Audit confirmed that data is being recorded and meets the requirements of Condition 28 of Schedule 4 of the Project Approval.

3.6 Odour

3.6.1 Criteria

3.6.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for air quality management in Schedule 4 Conditions 23 to 30, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following criteria for air quality have been established by the Project Approval:

- Schedule 4 Condition 29e:
  - WCC shall prepare and implement an air quality monitoring program that:
    - Is capable of evaluating the performance of the landfill;
    - Includes a protocol for determining any exceedances of the relevant conditions of approval and responding to complaints;
    - Adequately supports the air quality management system; and
    - Evaluates and reports on the effectiveness of the air quality management system.
- Schedule 4 Condition 26c:
  - WCC shall regularly assess air quality monitoring data and relocate, modify, and/or stop operation to ensure compliance with the relevant conditions of this consent.
- Schedule 4 Condition 23:
  - WCC shall ensure the project does not cause or permit the emission of any offensive odour (as defined by the POEO Act).

3.6.1.2 EPL 5862

In accordance with Section 3 (L4) of EPL 5862 offensive odour must not emit beyond the boundary of the premises. The performance criteria adopted for potential offensive odour emissions was occurrences (if any) of complaints from members of the public relating to odour.

3.6.1.3 Management Plans

All odour monitoring requirements in the LEMP and CEMPF are covered by the Project Approval and EPL 5862.

3.6.1.4 EA Predictions

Section 14.4.1 of the EA stated that, using CALPUFF dispersion modelling and odour emissions data, the predicted odour concentrations would not exceed the OEH assessment criterion at the nearest residences during the identified worst-case scenarios of Stage 1 and Stage 4 of the project. It was noted that

compliance with the OEH assessment criteria does not mean that odour would never be detected at identified receptors, but that it is not predicted to be detected more than 1 percent of the time at the relative level.

3.6.2 Results

Odour-related complaints are summarised in **Section 4** of this document for the reporting period.

3.6.3 Analysis

3.6.3.1 Comparison against statutory requirements, limits or performance measures/criteria

Refer to **Section 4** for a discussion of odour-related complaints.

3.6.3.2 Comparison against relevant EA predictions

Odour monitoring is required as part of the construction and operation of the site, and therefore, a comparison against the OEH assessment criteria is not applicable.

3.6.4 Trend Identification

Refer to **Section 4** for a discussion on trends of odour-related complaints.

3.7 Dust

3.7.1 Criteria

3.7.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for air quality management is Schedule 4 Conditions 23 to 30, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following criteria for air quality have been established by the Project Approval:

- Schedule 4 Condition 24:
  - WCC shall ensure that dust generation by the project does not exceed the criteria listed in Tables 2 to 4 at any private residential receiver, or on more than 25 percent of any privately owned land surrounding the site.
- Schedule 4 Condition 26:
  - WCC shall regularly assess air quality monitoring data and relocate, modify, and/or stop operation to ensure compliance with the relevant conditions of this consent.

Dust generation criteria referred to in Schedule 4 Condition 24 is provided in **Figure 3-1** below.

Table 2: long term criteria for particulate matter

Pollutant	Averaging	[D]criterion
Total suspended particulate (TSP) matter	Annual	[A]90 µg/m³
Particulate matter < 10 µm (PM10)	Annual	[A]30 µg/m³

Table 3: short term criterion for particulate matter

Pollutant	Averaging	[D]criterion
Particulate matter < 10 µm (PM_{10})	24 hour	[A]50 µg/m³

Table 4: long term criteria for deposited dust

Pollutant	Averaging	Maximum increase in deposited dust level	Maximum total[1] deposited dust level
[C]Deposited dust	Annual	[B]2 g/m²/month	[A]4 g/m²/month

Notes for tables 2 -4:

- *[A] total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to other sources);*
- *[B] incremental impact (i.e. incremental increase in concentrations due to the development on its own);*
- *[C] deposited dust is to be assessed as insoluble solids as defined by standards Australia, AS/NZS 3580.10.1:2003: methods for sampling and analysis of ambient air - determination of particulate matter - deposited matter - gravimetric method; and*
- *[D] excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agree to by the Director-General in consultation with the EPA.*

Figure 3-1: Table 2 to Table 4 Dust Criteria from Project Approval

3.7.1.2 Management Plans

The requirements of Project Approval Schedule 4 Condition 24 are mirrored in the LEMP (Section 9.4) and the CEMPF (Section 3.1.4).

The LEMP requires that monitoring of both particulate matter (PM10 and TSP) and deposited dust is required monthly (recommended at the end of the month).

3.7.1.3 EA Predictions

The EA stated that results from the dispersive modelling for dust suggested that the proposed project would comply with the relevant legislative criteria at all potential off-site residential receivers provided that appropriate mitigation and management measures are implemented. These measures included restricting the size of the active tipping face and daily cover areas.

Construction operations were predicted to result in dust emissions that were low and short-term, and cumulative dust impacts were unlikely to exceed the relevant criterion.

3.7.2 Results

Particulate matter monitoring (PM10 and TSP) has been completed monthly since December 2017, with the exception of April 2018 and May 2018. Particulate matter monitoring is completed at two locations (refer to **Figure 3-2**):

- DDG-1 Whytes Gully.
- DDG-2 Glengarry Cottage.
- Results from particulate matter monitoring is provided in **Table 3-2.**

Deposited dust monitoring has been completed monthly since dust depositional gauges were installed on 10 February 2017. For completeness, all deposited dust monitoring has been included in this report. Deposited dust monitoring is completed at five locations (refer to **Figure 3-2**):

- DDG-1 Whytes Gully.
- DDG-2 Glengarry Cottage.
- DDG-3.
- DDG-4.
- DDG-5.

Results from deposited dust monitoring is provided in **Table 3-3** and **Table 3-4**.

Laboratory results for both particulate matter and deposited dust monitoring is provided in **Appendix G**.

Figure 3-2: Locations of dust monitoring at the site

Table 3-3 Particulate Matter Monitoring Results since December 2017

Monitoring location	Date	Short-term criterion		Long-term criteria	
		Particulate matter < 10 um (PM10) (ug/m^3)	Total suspended particulate (TSP) matter (ug/m^3)	Particulate matter < 10 um (PM10) (ug/m^3)	Total suspended particulate (TSP) matter (ug/m^3)
		Criterion: 50 ug/m^3 average over 24 hours		Criterion: 30 ug/m^3 annual average	Criterion: 90 ug/m^3 annual average
DDG-1	13/12/2017	13	20.6		
	23/01/2018	16.7	31.3		
	20/2/2018	15.8	23.8	14.04	24.02
	20/3/2018	20.4	35.7		
	20/6/2018	4.3	8.7		
DDG-2	13/12/2017	**57.8***	132		
	23/01/2018	32.5	59.3		
	20/2/2018	12.6	24.2	**33.28**	67.22
	20/3/2018	**52***	92.4		
	20/6/2018	11.5	28.2		

Notes:

Results in bold exceed the criterion

* Results are indicated to be monthly rather than 24 hourly, so not a true reflection of exceedance of short term criterion for particulate matter

** Averages based on limited data (5 monthly) rather than annual data.

Table 3-4 Deposited Dust Monitoring Results since March 2017

Month	Dates	Deposited dust total (g/m^2/month)				
		DDG-1	DDG-2	DDG-3	DDG-4	DDG-5
February 2017	10/2/17 to 13/3/17	1.6	0.7	0.7	0.6	4.7
March 2017	13/3/2017 to 10/4/17	0.8	0.8	0.9	0.9	0.5
April 2017	10/5/17 to 8/5/17	1.2	1.0	0.7	0.8	0.7
May 2017	8/5/17 to 8/6/17	0.7	1.8	0.6	1.0	0.9
June 2017	8/6/17 to 10/7/17	0.8	0.5	0.3	0.3	0.4
July 2017	10/7/17 to 8/8/17	0.9	0.8	1.0	0.7	0.6
August 2017	8/8/17 to 7/9/17	0.9	0.9	0.7	1.0	0.5
September 2017	7/9/17 to 9/10/17	2.9	1.4	0.8	1.4	0.7
October 2017	9/10/17 to 7/11/17	2.7	2.9	1.0	2.9	0.6
November 2017	7/12/17 to 8/12/17	0.8	1.3	1.2	3.3	0.4
December 2017	7/12/17 to 9/1/18	NA	1.4	1.4	2.8	1.0
January 2018	9/1/18 to 7/2/18	1.9	1.6	1.1	2.6	0.9
February 2018	7/2/18 to 9/3/18	1.4	0.5	0.8	0.9	0.9
March 2018	9/3/18 to 9/4/18	1.4	2.4	0.4	1.0	0.7
April 2018	9/4/18 to 7/5/18	2.0	1.7	0.8	1.1	0.7
May 2018	7/5/18 to 7/6/18	0.9	0.9	0.8	0.6	0.5
Annual Average	7/6/17 to 7/6/18	1.51	1.36	0.86	1.55	0.66

Notes:

Results in bold exceed the criterion for long term depositional dust of 2 g/m2/month maximum increase in deposited dust level

Results underlined exceed the criterion for long term depositional dust 4 g/m2/month maximum total deposited dust level (average)

NA = dust gauge destroyed and reinstated

3.7.3 Analysis

3.7.3.1 Comparison against statutory requirements, limits or performance measures/criteria

In response to Project Approval Schedule 4 Condition 24 and 26, dust monitoring is currently ongoing at five locations at the site (DDG-1, DDG-2, DDG-3, DDG-4 and DDG-5).

Monitoring results for both particulate matter and deposited dust monitoring at these sites in **Section 3.7.2** indicated that the site is generally in compliance with short and long term criteria as presented in Project Approval Schedule 4 Condition 24 (refer to **Figure 3-1**).

Particulate matter monitoring results indicated that the limited data from DDG-1 and DDG-2 were generally within the criteria stated in **Figure 3-1**.

Two exceedances of the short-term criterion for particulate matter were observed at DDG-2 on 13/12/2017 and 20/3/2018. However, particulate matter data represents a monthly total and is not comparative with the criterion which states that particulate matter should not exceed 50 ug/m^3 average over 24 hours. Based on this discrepancy these results should be discounted.

DDG-2 results exceedance of the long-term criterion for annual average particulate matter. However, it is noted that this annual average was only calculated using the available five months of data and should be discounted.

Deposited dust monitoring results indicated that data from DDG-1 to DDG-5 were within the criteria stated in **Figure 3-1**.

3.7.3.2 Comparison against relevant EA predictions

To date dust monitoring data from the site is compliant with the relevant legislative criteria, as predicted by the EA. In addition, there have been no reported complaints received relating to dust from off-site locations to date.

3.7.4 Trend Identification

From the available data, it has been demonstrated that dust monitoring data is compliant with the relevant legislative criteria.

3.8 Greenhouse Gas

3.8.1 Criteria

3.8.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for air quality management is Schedule 4 Conditions 23 to 30, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following criteria for air quality have been established by the Project Approval:

- Schedule 4 Condition 29e:
  - Includes an air quality monitoring program that:
    - Is capable of evaluating the performance of the landfill;
    - Includes a protocol for determining any exceedances of the relevant conditions of approval and responding to complaints;
    - Adequately supports the air quality management system; and
    - Evaluates and reports on the effectiveness of the air quality management system.
- Schedule 4 Condition 26c:
  - WCC shall regularly assess air quality monitoring data and relocate, modify, and/or stop operation to ensure compliance with the relevant conditions of this consent.
- Schedule 4 Condition 30c:
  - WCC shall develop and implement a Greenhouse Gas Management Plan that must include, as a minimum, a program to monitor the effectiveness of these measures, and a protocol to periodically review the plan.

It is noted that the requirements of the EPL 5862 for gas monitoring supersedes the conditions of the Project Approval.

3.8.1.2 EPL 5862

The EPL 5862 states that the following greenhouse gas monitoring is required:

- Surface gas monitoring for methane in accordance with Section 5 (M2.2) of EPL 5862.

- Subsurface gas monitoring for methane in accordance with Section 5 (M2.2) of EPL 5862.
- Gas accumulation monitoring for methane in accordance with Section 5 (M2.2) of EPL 5862.

The results of surface gas monitoring were screened against the criteria provided in the *Environmental Guidelines* (EPA 2016). Specifically, the threshold level for further investigation and potential action was detection of methane at any point of the landfill above 500 parts per million (ppm).

The results of subsurface gas monitoring were screened against the criteria provided in the *Environmental Guidelines* (EPA 2016). Specifically, the threshold levels for further investigation and corrective action were detection of methane at concentrations above 1% (volume/volume) and carbon dioxide at concentrations of 1.5% (v/v) above established natural background levels.

The results of gas accumulation monitoring within enclosed buildings and structures were screened against the criteria provided in the *Environmental Guidelines* (EPA 2016). Specifically, the threshold level for further investigation and corrective action was detection of methane at concentrations above 1% (v/v).

3.8.1.3 Management Plans

Section 8 of the LEMP outlines various gas monitoring requirements for the site. However, it is considered that the monitoring requirements of the EPL 5862 and *Environmental Guidelines* (EPA 2016) for gas monitoring supersede the requirements of the LEMP.

3.8.1.4 EA Predictions

Section 11.2 of the EA included a summary of modelling of landfill gas emissions, which predicted a significant volume of gas generation from within both the existing landfill and the proposed new landfill cell as a result of the project. Emissions are predicted to peak at the cessation of filling in 2053 at approximately 105 $ktCO_2e$, with the tabulated predictions presented below in **Figure 3-3.**

Year Ending	Methane Generated ($ktCO_2e$)	Emissions - Post CH_4 Oxidation ($ktCO_2e$)
2013	0	0
2014	14.04	12 635
2015	26.20	23.58
2053 (peak)	117.37	105.63

Figure 3-3 Estimated Annual Landfill Emissions (source: Appendix E GHG Assessment of the EA)

The EA noted that infrastructure to capture produced gas is proposed for installation during construction of the Project to ensure that energy use of the project is reduced where feasible. If practices such as sacrificial horizontal gas collection are utilities, higher gas capture efficiencies than the estimated 50 percent could be achieved, which could further reduce GHG emissions beyond that modelled for the project.

3.8.2 Methodology

The subsections below describe the frequency of monitoring, monitoring method, monitoring locations and analytes for surface gas, subsurface gas, gas accumulation, stormwater and groundwater. The fieldwork methodologies implemented during the reporting period were developed in consideration of the guidance provided in the NSW EPA *Environmental Guidelines: Solid waste landfills (second edition)* (EPA 2016). The location of each gas monitoring point is presented in Figures 3 and 4 of **Appendix F**.

3.8.2.1 Surface Gas

Surface gas monitoring was completed during the reporting period to assess for potential surface gas emissions of methane emitting from areas of deposited waste, i.e. the current and historical landfill areas.

Surface gas monitoring for methane was completed monthly during the reporting period in accordance with Section 5 (M2.2) of EPL 5862. Methane was measured by a third party contractor, ALS Environmental, using an Inspectra Laser Gas Detector. The instrument used to measure methane concentrations was calibrated prior to each monitoring event.

Surface gas monitoring was achieved by testing the atmosphere 5 centimetres above the ground surface in areas with intermediate or final cover where wastes have been placed. The monitoring was completed on calm days (winds below 10km/hr) and on transects with an approximate spacings of 25m.

3.8.2.2 Subsurface Gas

Subsurface gas monitoring was completed during the reporting period to detect the potential presence of methane around the perimeter of the landfill cell to assess the potential for offsite migration of methane onto surrounding properties.

Subsurface gas monitoring for methane was completed monthly during the reporting period in accordance with Section 5 (M2.2) of EPL 5862. Subsurface gas monitoring was measured by a third party contractor, ALS Environmental, using an Inspectra Laser Gas Detector. The instrument used to measure methane concentrations was calibrated prior to each monitoring event.

Subsurface gas monitoring was achieved by testing the methane concentration in twelve landfill gas monitoring wells (listed below) that are situated around the northern, eastern and southern perimeters of the landfill. The contents of each well was sampled and analysed prior to potential dilution by air.

Subsurface gas monitoring for methane was undertaken at twelve landfill gas monitoring wells, Point 21 (LFG MW1) to Point 32 (LFG MW12), in accordance with Section 5 (M2.3).

3.8.2.3 Gas Accumulation

Gas accumulation monitoring was completed periodically during the reporting period to demonstrate that gas is not accumulating at dangerous levels in enclosed spaces on or near the landfill.

Gas accumulation monitoring for methane was completed monthly during the reporting period in accordance with Section 5 (M2.2) of EPL 5862. Methane was measured by a third party contractor, ALS Environmental, using an Inspectra Laser Gas Detector. The instrument used to measure methane concentrations was calibrated prior to each monitoring event.

Gas accumulation monitoring was undertaken in all accessible buildings and other enclosed structures within 250m of deposited waste or leachate storage. Some buildings and structures within 250m were not assessed as they were inaccessible and/or the owner did not permit authority to access the building.

Gas accumulation monitoring was undertaken at the following locations during the reporting period:

- Weighbridge
- Glengarry Cottage (administrative building)

3.8.3 Results

3.8.3.1 Surface Gas

The highest reported concentration of methane was 144 ppm measured at transact 10 during the October 2017 monitoring event, below the threshold level for further investigation and corrective action of 500 ppm.

3.8.3.2 Subsurface Gas

The highest reported concentration of methane was 0.0067% (v/v), measured in monitoring point 27 (LFGMW7) during the May 2018 monitoring event, below the threshold level for further investigation and corrective action of 1% (v/v).

Monitoring points 31 (LFGMW11) and 32 (LFGMW12) were inaccessible during the April monitoring event.

3.8.3.3 Gas Accumulation

The highest reported concentration of methane was 0.00044 % (v/v), measured within the weighbridge during the April 2018 monitoring event, below the threshold level for further investigation and corrective action of 1 % (v/v).

3.8.4 Analysis

3.8.4.1 Comparison against statutory requirements, limits or performance measures/criteria

Surface Gas

Surface gas monitoring completed during the reporting period did not identify surface methane concentrations that exceeded the threshold level. As such non-conformances of the EPL did not occur during the reporting period with respect to surface gas emissions.

Subsurface Gas

Subsurface gas monitoring completed during the reporting period did not identify subsurface methane at concentrations that exceeded the threshold level. As such non-conformances of the EPL did not occur during the reporting period with respect to subsurface gas.

Gas Accumulation

Gas accumulation monitoring completed during the reporting period did not identify methane at concentrations that exceeded the threshold level. As such non-conformances of the EPL did not occur during the reporting period with respect to gas accumulation.

3.8.4.2 Comparison against relevant EA predictions

Gas monitoring completed during the 2017-2018 reporting period indicates that excessive concentrations of methane were not recorded emitting from the tip face, accumulating within enclosed structures or in subsurface monitoring wells surrounding the landfill. The EA prediction relates to methane generation projections, and whilst elevated methane was not detected during gas monitoring associated with EPL conditions, the actual gas generation from the landfill has not been quantified and therefore comparison against the EA prediction cannot be made.

Any methane generated as a result of decomposition of buried waste is inferred to be collected by the subsurface methane collection system and flared.

3.8.5 Trend Identification

Interpretation of historical subsurface gas, surface gas and gas accumulation data indicates that methane has remained remained consistently below the recommended threshold level.

3.9 Noise

3.9.1 Criteria

3.9.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for noise management is Schedule 4 Conditions 31 to 34, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following criteria for noise have been established by the Project Approval:

- Schedule 4 Condition 31:
  - WCC shall ensure that the noise generated by the operations on site does not exceed the criteria in Table 6 at any private residential receiver.
- Schedule 4 Condition 32a:
  - WCC shall implement best management practice, including all reasonable and feasible noise management and mitigation measures to prevent and minimise operational, low frequency and traffic noise generated by the project.
- Schedule 4 Condition 34e (Modification 1):
  - WCC shall prepare and implement a Noise Management Plan for the project in consultation with the EPA and to the satisfaction of the Secretary. The plan must:
    - e) Include a noise monitoring program that:
      - Is capable of evaluating the performance of the project;
      - Includes a protocol for determining exceedances of the noise limits in this approval and responding to complaints;
      - Adequately supports the noise management system; and
      - Evaluates and reports on the effectiveness of the noise management system.

Noise impact assessment criteria referred to in Schedule 4 Condition 31 is provided in **Figure 3-4** below.

Table 6: Noise impact assessment criteria dB(A)

Residential Receiver Location	Day
	$L_{Aeq\ (day)}$
N1	47
N2	45
N3	38
N4	35
N5	35

- *To identify a residential receiver location, refer to Appendix 6 of this approval and Appendix D of the EA.*
- *Noise generated by the project is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.*

Figure 3-4: Table 6 from Project Approval

3.9.1.2 Monitoring Plans

Section 3.4.5 of the CEMPF outlined the noise monitoring requirements for construction, as outlined below:

- Contractor to complete monitoring throughout construction
- Periodic noise monitoring at nominated sensitive receivers at the start of construction activities.
- Periodic noise monitoring at nominated sensitive receivers on a monthly basis while significant noise generating activities are being undertaken.
- Ongoing spot checks of noise intensive plant and equipment at the commencement of project and throughout construction.
- Details of site activities and equipment usage for each monitoring event
- Preparation of noise monitoring report

3.9.1.3 EA Predictions

A comprehensive noise assessment was undertaken by Golder Associates, which determined the noise impact criteria based upon existing noise levels and predicted noise levels that are expected as a result of the project. Due to concurrent construction and landfill operation activities, it was predicted that cumulative noise levels would result in minor noise exceedances at isolated residences during certain stages of the project.

These predictions were used to set the noise impact assessment criteria presented above in **Figure 3-4**.

3.9.2 Results

Construction and operational noise monitoring data has not been reviewed as part of this document. The Independent Auditor noted that evidence of the evaluation and reporting on the effectiveness of the noise management system was not provided, and the auditor recommended that a review of the implementation of the noise management plan for operations and construction is completed to ensure compliance with this condition.

3.9.3 Analysis

3.9.3.1 Comparison against statutory requirements, limits or performance measures/criteria

Comparison against the relevant statutory requirements has not been completed due to an absence of noise monitoring data. Compliance with the noise monitoring requirement listed in Section 3.4.5 of the CEMPF have generally not been demonstrated, and non-complying criteria are listed in **Section 5.3**.

3.9.3.2 Comparison against relevant EA predictions

Comparison against the relevant EA predictions has not been completed due to an absence of noise monitoring data.

3.9.4 Trend Identification

Trend identification was unable to be completed due to lack of noise monitoring data.

3.10 Hazards

3.10.1 Background

3.10.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for hazard management in Schedule 4 Conditions 42 to 46, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following criteria relating to hazards have been established by the Project Approval:

- Schedule 4 Condition 45:
  - WCC shall:
    - Implement suitable measures to manage pests, vermin and declared noxious weeds on site; and
    - Inspect the site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in surrounding areas.

3.10.1.2 Management Plans

Section 9.5 of the LEMP states that noxious weed surveys should be completed by site staff on a quarterly basis (March, June, September and December).

The Vegetation and Biodiversity Management Plan (Biosis, 2013) outlines the requirements for biodiversity management, and a review of the site's compliance with these requirements is provided in **Appendix B**.

The following monitoring criteria for biodiversity have been established by the plan:

- The monitoring program should be carried out by the bush regeneration contractor or a suitably qualified and experienced restoration ecology consultant (Section 3.10).
- Establishment of photo points within one month of the award of the contract (Section 3.10.2).
- Quarterly photographic monitoring over a 5-year period (Section 3.10.2).
- Annual reporting for five years (Section 3.10.3).
- Further consultation regarding a conservation agreement for all areas proposed for environmental restoration works within this VMP, and a voluntary joint agreement between WCC and OEH is recommended (Section 3.11.1).

It is noted that an updated Vegetation Management Plan (Biosis, July 2017) has been prepared. However, this document was unable to be sighted due to the document not yet finalised. WCC have advised that a review of the sites vegetation management plan is underway, having requested biosis to undertake a review of their vegetation management to align with site operations, in addition WCC have:

- Undertaken pre-clearance surveys (Biosis)
- Split the site into zones more effective vegetation management
- Improved daily cover by trialling a "con-cover" material.

3.10.1.3 EA Predictions

There were no predictions in the EA regarding pests, vermin or declared noxious weeds at the site.

3.10.2 Results

WCC reported that the site is inspected monthly and control measures are undertaken periodically derived from inspection results. However, there was no evidence sighted of quarterly monitoring, as required under Section 9.5 of the LEMP.

Biosis Pty Ltd was commissioned by WCC to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013) in June 2017. An updated Vegetation Management Plan was prepared following this review. However this document was not sighted due to the document not yet finalised.

The Independent Environmental Audit (**Appendix D**) noted that noxious weeds were evident across the site, and current weed controls appeared to be limited and ineffective. The audit also noted that seven weed management visits were scheduled for 2017, and emails discussing weed controls services during 2016 and 2017 were sighted. However, the audit noted that WCC did not demonstrate that a systematic and through approach is taken to management and control of weeds at the site.

3.10.3 Analysis

3.10.3.1 Comparison against statutory requirements, limits or performance measures/criteria

During the reporting period, there was no evidence that the monitoring requirements under the Project Approval, LEMP or Vegetation Management Plan have been adequately completed at the site.

The update Vegetation Management Plan (2017) included management actions to satisfy the condition criteria outline in the VMP to date. These management actions are proposed to be undertaken within a 12-month period.

3.10.3.2 Comparison against relevant EA predictions

There were no predictions in the EA regarding pests, vermin or declared noxious weeds at the site.

3.10.4 Trend Identification

Hazard management trends since commencement are currently unable to be assessed.

3.11 Biodiversity

3.11.1 Background

3.11.1.1 Project Approval

The Project Approval MP11_0094 outlines the requirements for biodiversity management is Schedule 4 Conditions 49 to 50, and a review of the site's compliance with these conditions is provided in **Appendix A.**

The following monitoring criteria for biodiversity have been established by the Project Approval:

- Schedule 4 Condition 49 (Modification 2):
  - WCC shall prepare and implement a Vegetation Management Plan for the project to the satisfactory of the Secretary. This plan must:
    - (d) must specifically include a Biodiversity Offset Strategy
    - (g) detail the site-wide ecological management and monitoring program/s to be implemented for the life of the project.

3.11.1.2 Management Plans

The Vegetation and Biodiversity Management Plan (Biosis, 2013) outlines the requirements for biodiversity management, and a review of the site's compliance with these requirements is provided in **Appendix B**.

The following monitoring criteria for biodiversity have been established by the plan:

- The monitoring program should be carried out by the bush regeneration contractor or a suitably qualified and experienced restoration ecology consultant (Section 3.10).
- Establishment of photo points within one month of the award of the contract (Section 3.10.2).
- Quarterly photographic monitoring over a 5-year period (Section 3.10.2).
- Annual reporting for five years (Section 3.10.3).
- Further consultation regarding a conservation agreement for all areas proposed for environmental restoration works within this VMP, and a voluntary joint agreement between WCC and OEH is recommended (Section 3.11.1).

It is noted that an updated Vegetation Management Plan (Biosis, July 2017) has been prepared. However, this document is yet to be sighted.

3.11.1.3 EA Predictions

The EA noted that the Green and Golden Bell Frog (GGBF) and Australian Painted Snipe (APS) are unlikely to occur, however have potential to occur at the site. The Statement of Commitments noted that two additional targeted surveys of the GGBF should be completed to confirm results of targeted surveys.

3.11.2 Results

There is no evidence of on-site biodiversity works during the reporting period.

3.11.3 Analysis

3.11.3.1 Analysis Comparison against statutory requirements, limits or performance measures/criteria

In 2017, WCC required an updated assessment of the current condition of the vegetation within the study area and the maintenance required to meet the performance criteria to date as outlined in the VMP (Biosis 2013). Performance criteria 'to date' was based on the assumption that the proposed works program would currently be in year four, if the VMP had been implemented in 2014. A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outline in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12-month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works.

Regeneration works are to be prioritised in the areas of vegetation in best condition; Management Zones 2 and 3 specifically, as these zones contain highest condition native vegetation remnants, including Illawarra Subtropical Rainforest EEC in Management Zone 2 and Illawarra Lowlands Grassy Woodland in Management Zone 3. Revegetation of Management Zones 5a and 5b should be undertaken using the plants provided in the recommended species lists provided in the VMP (Biosis, 2013). The management actions for each Management Zone are outlined in Table 3 of the document.

As noted in **Section 5** of this document, WCC should implement weed controls as defined in the Vegetation Management Plan. WCC should also complete the implementation of the Vegetation Management Plan in full (in addition to weed management as defined above) and in regard to Offsets as detailed in the Vegetation Management Plan. Progress of the implementation of the VMP should be reported in the Annual Environmental Reports. Evidence of compliance with the monitoring criteria provided in the Vegetation Management Plan has not been provided, and the site is non-compliant with these requirements.

3.11.3.2 Comparison against relevant EA predictions

WCC provided a Whytes Gully New Landfill Cell – Terrestrial and Aquatic Flora and Fauna Assessment (May 2013). A flora and fauna assessment has been conducted for the Study Area in regard to the proposed Whytes Gully New Landfill Cell.

This assessment has recorded one EEC and two threatened fauna species within the Study Area and has concluded an additional seven fauna species were considered likely to occur within the Study Area and may potentially be impacted by The Project. Targeted surveys for the GGBF and APS did not record these species and they were subsequently deemed a low likelihood of occurrence. Assessments of Significance for these EEC and species have concluded that, providing recommended avoidance and mitigation measures are adhered to, The Project is unlikely to have a significant impact on the threatened species or the EEC assessed."

3.11.4 Trend Identification

There is no evidence of on-site biodiversity works during the reporting period or since commencement of the project.

3.12 Other Environmental Considerations

Conditions for the following environmental areas were listed in the Project Approval MP11_0094, however have been adequately covered by the responses in **Appendix A** and require no ongoing environmental monitoring:

- Transport: Schedule 4 Conditions 35 to 38.
- Visual Amenity: Schedule 4 Conditions 39 to 41.

- Heritage: Schedule 4 Conditions 47 to 48.
- Rehabilitation and Final Landform: Schedule 4 Condition 51.

4 Complaints

In accordance with Condition 5(b) of Schedule 5 of the Project Approval, this section provides analysis of complaints recorded for the project over the reporting period. In addition, this section provides a comparison of these results against the relevant statutory requirements, limits or performance measures/criteria, and the relevant predictions provided in the EA (Golder, 2012).

4.1 Background

Complaints regarding the WWARRP are logged in WCC's Customer Request Management System 'Pathways'. A summary form of the complaints are provided in the annual returns for EPL 5862 and are published on the WCC website:
http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx

4.2 Criteria

In accordance with Section 3 (L4) of EPL 5862 offensive odour must not emit beyond the boundary of the premises. The performance criteria adopted for potential offensive odour emissions was occurrences (if any) of complaints from members of the public relating to odour.

In addition, Schedule 4 Condition 32(a) states that WCC shall implement best management practice, including all reasonable and feasible noise management and mitigation measures to prevent and minimise operational, low frequency and traffic noise generated by the project.

4.3 Results

4.3.1 Complaints relating to odour

Formal complaints received by WCC during the 2017-2018 reporting period was limited to nine complaints relating to offensive odour detected at offsite locations. An Environmental Incident Form was completed for each complaint with the pertinent information summarised below in **Table 4-1**.

Table 4-1 Odour Complaints for 2017-2018 reporting period

Date of Complaint	Nature of Complaint	Additional Information
14/06/2017	Offensive odour	Offensive odour reported to EPA on 14 June 2017. EPA forwarded the complaint to Wollongong City Council - waste services via email on 27 June 2017. Exceptional circumstances were not undertaken at the time of the complaint. The deodoriser was present on site and accessible for workers.
19/08/2017	Offensive odour	An after-hours call was received by EPA (Ref 147636). A strong offensive odour was reported from near Whytes gully tip, with the odour first noted around 5pm. Reviewed weather station data and waste works diary to identify issues that may be responsible. No unusual operational activities occurred around the incident date and time. The team working at the tip face were reminded to follow operational procedures and to cover waste in accordance with the EPL.
13/01/2018	Offensive odour	A complaint of offensive odour was received by the EPA from an individual located at the Farmborough Heights area at around 12:30pm. The weather was hot (30°C) with previous days up to 40°C+. Winds were gusting 50km/hr from the west-north-west. No unusual operational activities occurred at Site around the complaint date and time. The Site Waste Coordinator visited Highview Drive (Farmborough Heights) and could not detect an offensive odour.
16/01/2018	Offensive odour	Three complaints of offensive odour were received by the EPA from the Farmborough Heights area. The individual who reported the odour advised the odour was ongoing and offensive. No unusual operational activities occurred at Site around the complaint date and time. The Site Waste Coordinator visited Highview Drive (Farmborough Heights) and could not detect an offensive odour. The individual who reported the odour was contacted by phone by WCC to confirm the nature of the complaint.
17/01/2018	Offensive odour	A complaint of offensive odour was received by the EPA from an individual located at the Farmborough Heights with the reported odour described like a "horse stable smell".

Date of Complaint	Nature of Complaint	Additional Information
		The weather was warm (21°C) with previous days up to 40°C+. Winds were gusting 48km/hr from the south-south-east. No unusual operational activities occurred at Site around the complaint date and time. The Site Waste Coordinator visited Highview Drive (Farmborough Heights) and could not detect an offensive odour.
5/03/2018	Offensive odour	An offensive odour was reported to the EPA at 8:00am from an individual located at Farmborough Heights. The odour was noted for a period of 1.5hr on two consecutive mornings on the 5th and 6th and was described by the individual as faint. The individual also noted that the odour is usually smelled early in the morning following rainfall events and suspects it is associated with removal of daily cover. There was a slight breeze from the south-west at the time of the complaint. No unusual operational activities occurred at the time of the complaint. The deodoriser was in place and utilised prior to lifting lids in the morning.
20/03/2018	Offensive odour	An individual from Farmborough Heights reported a strong offensive odour. The wind at the time of the complaint was up to 41km/hr from the south-east.
20/04/2018	Offensive odour	An offensive odour was reported to the EPA at from an individual from Farmborough Heights at 1:00pm. The individual reported the presence of a strong odour from within their house that they believed was originating from the Site. The weather conditions at the time of the complaint was mild with only slight winds from the south-east. No unusual operational activities occurred at Site around the complaint date and time. The team working at the tip face were reminded to follow operational procedures and to cover waste in accordance with the EPL.

4.3.2 Complaints relating to noise

The Independent Auditor noted that in the Whytes Gully Reference Group Meeting minutes dated 22 November 2017, a community representative mentioned “the pitch of the compactor and loaders reversing signals”.

4.4 Analysis

4.4.1 Comparison against statutory requirements, limits or performance measures/criteria

4.4.1.1 Odour

A total of nine complaints relating to odour were received from members of the public during the 2017-2018 reporting period. In each instance the individual making the complaint believed the subject odour was originating from the site. Each complaint was investigated by WCC to confirm the nature of the complaint and to identify suitable corrective actions.

The nearest sensitive receptor to the site is a residential dwelling located approximately 150 m north of the current active tip face and the suburb of Farmborough Heights, which is a predominantly low density residential suburb, and is located approximately 500 m north east of the site.

Given the relatively close proximity of sensitive receptors to the site, the complaints received during the reporting period relating to odour are not unexpected and are considered acceptable, particularly since suitable odour suppression techniques were implemented at the tip face.

The controls for mitigating release of odour, including application of daily cover and the use of a deodoriser, were utilised prior to each complaint being reported. Additionally, the site Waste Coordinator visited the location of the complaint on numerous occasions to validate the complaint, however was unable to detect an offensive odour on any occasion.

4.4.1.2 Noise

WCC indicated the noise comment raised by the Whytes Gully Reference Group Meeting on 22 November 2017, which is being investigated. Confirmation is yet to be received relating to the use of low frequency reversing alarms on all plant. No official noise complaints were received for the site.

4.4.2 Comparison against relevant EA predictions

No predictions relating to complaints were provided in the EA.

4.5 Trend Identification

Table 4-2 provides a summary of odour complaints against the site raised per year in the EPL Annual Returns.

Table 4-2 Summary of Odour Complaints from Annual Returns

Annual Return Year	Dates of Reporting Period	Number of Complaints
2013/14	29 May 2013 to 28 May 2014	48
2014/15	29 May 2014 to 28 May 2015	10
2015/16	29 May 2015 to 28 May 2016	38
2016/17	29 May 2016 to 28 May 2017	27
2017/18	29 May 2017 to 28 May 2018	9

The following changes to on-site operations was noted in the Independent Environmental Audit which may have impacted odour production at the site:

- 2004: Closure of the solid waste energy recovery facility.
- 1 July 2014: Kerbside green waste no longer stored at the WWARRP, and all organics are removed from the site and processed at a nearby site on Reddalls Road.

The number of odour complaints received has been progressively decreasing for the site, as shown in **Table 4-2**. The EPL annual return for 2016/17 noted that the overlying trend for environmental complaints has been downward since the closure of the solid waste energy recovery facility in 2004.

A spike of approximately 150 odour complaints during the reporting periods 2011/12 to 2013/14 coincided with WCC commencing community engagement over the current landfill cell development at the site.

WCC investigations into a spike of air pollution complaints received during the 2016/17 reporting period noted that almost 85% of the complaints were received in March 2017 which coincided with the timing of the proposed expansion of the organics processing facility and the associated notification and advertising to key stakeholders and neighbours. The EPA provided a letter in response to complaints in March 2017 and noted that *"it believes it has identified the cause of the recent odour complaints which relate to a premises not under Wollongong City Council Control."*

5 Non-compliances and Actions

In accordance with Condition 5(c) of Schedule 5 of the Project Approval, this section identifies non-compliances that occurred during the reporting period, and describes what actions were (or are being) taken to ensure compliance. In addition, this section summarises the actions that will be implemented over the next reporting period to improve the environmental performance of the project in accordance with Condition 5(e) of Schedule 5 of the Project Approval.

5.1 Project Approval

5.1.1 Non-compliances and Not Verified

Table 5-1 provides details of non-compliances of the Project Approval that were identified during the Independent Environmental Audit (MCW Environmental Consulting, March 2018) and this Annual Review, as well as the actions that have been completed or are being completed to ensure compliance.

Table 5-1 Project Approval Non-Compliance and Not Verified Conditions - MCoA MP11_0094 and Statement of Commitments

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 3 Condition 7	Within 12 months from the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall surrender the development consents identified in Table 1 in accordance with Section 75YA and 104A of the EP&A Act	At the time of the audit site inspections WCC could not demonstrate that they had surrendered the previous development consents. On 29 March 2018, WCC provided documents showing surrender of the leases detailed in Table 1, on 13 March 2018, except for DA 1996/8256 and DA-1996/6256. The surrender followed an application to surrender the leases dated 7 February 2018. On the basis that the Development Consents were not surrendered within 12 months of the date of the Approval (being 3 April 2013); and that surrender of two development consents may be outstanding; WCC is considered non-compliant with this condition.	Non-compliant **Recommendation**: Ensure that development consents DA 1996/8256 and DA-1996/6256 are surrendered in accordance with Condition 7: Schedule 3.	All of the relevant DA consents have been surrendered by the 27th March 2018. As noted in **Appendix A**, the condition is considered complied with.	Compliant	No actions required.
Sch 3 Condition 9	All existing environmental management plans that	WCC reported that during the transition period until the approval of the Landfill Environmental	Not Verified	WCC confirmed that all environmental management plans currently in use (LEMP,	Compliant	Undertake a review of management plans to

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
	apply to the site under those DAs listed in Table 1 of this Schedule shall continue to be fully applied until replaced under this approval.	Management Plan (LEMP) in 2014 and Construction Environmental Management Plan Framework (CEMPF) in 2013, all existing management plans prevailed. This audit has not considered the management plans under the DA's listed in Table 1. Due to the time elapsed since the commencement of the LEMP and hence replacement of the former management plans, it was not possible to verify whether the plans were in place until replaced under this approval.		CEMPF and associated subplans and procedures) have been prepared in light of the Project Approval.		confirm their relevance and appropriateness. Within three months of submitting Annual Review.
Sch 4 Condition 9a	The Proponent shall: a) implement suitable measures to prevent the unnecessary proliferation of litter both on and off-site, including the installation and maintenance of a mesh fence of not less than 1.8 metres high around the site; and b) inspect daily and clear the site (and if necessary, surrounding area) of litter on at least a weekly basis.	Fencing was installed around the boundary of the landfill. Cleaning of litter around the perimeter was reported to be conducted by WCC on a campaign basis at least weekly. WCC reported that daily inspections are carried out that includes litter inspections. A template form including the item "workplace free of litter and obstructions" was sighted. During the site inspection significant quantities of litter was observed across the site, generally caught in obstructions such as shrubs, trees and fences and also in and around landfill areas. Off site areas were not accessible to inspect. Minutes of the 2017 Whytes Gully reference group (22 November 2017) indicated that residents advised "that there is a lot of rubbish around, In particular in Reddalls Road, from the corner of the tip to the car yard. One member also mentioned that the area near where he lives there are plastic bags up in the trees." On the basis of site	Non-compliant	WCC utilise litter picking crews on a monthly basis. Additionally, since relocation of the tipping face to the new landfill cell work has been done to remove windblown litter across the site, reshape the former cell, removing semi exposed litter and spray seed the exposed faces. Invoices provided for the month of February (28/2/19). The new landfill cell has proven to be less exposed to prevailing winds and control of windblown litter has been more manageable. Trial of a Con-Cover machine is to occur in the first half of the new financial year to provide better daily cover of the tipping face. EPA licence variation not yet submitted to EPA.	Ongoing	Clarification with DPEImmediately Commence trial of Con-Cover as daily cover.

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
		observations during both site inspections, and the feedback from community representatives at the November Whytes Gully reference group, that WCC are not compliant with this condition and that there is significant opportunity to reduce the amount and extent of litter at the site (and off site) through better controls or through more frequent litter reduction campaigns. It is noted that the condition requirement to "clear the site" of litter is very challenging given the extent of plastic bags etc. disposed of at the landfill on a daily basis	**Recommendation**: Increase the effectiveness of litter reduction controls and of litter reduction campaigns to reduce on and off site litter. **OFI**: Reconsider with DPE what would be acceptable in terms of "clear the site of litter" so as to be able to comply with this condition	Similarly a trailer mounted commercial vacuum unit is being purchased to assist in removing litter from fence line. .		
Sch 4 Condition 14	The Proponent shall ensure that all licensed surface water discharges from the site comply with the discharge limits (volume and quality) set for the project in any EPL or relevant provisions of the POEO Act	As noted in the annual report 2016-2017, surface water that exited the site in June 2016 and July 2016 contained suspended solids at levels above the 50mg/L concentration limit prescribed in the site's EPL. Downstream samples taken at the same time indicated suspended solids <50mg/L concentration limit and it was reported by WCC that there was no material harm caused by the non-compliance (as defined	Non-compliant	This non-compliance has been reported to the EPA and additional processes and procedures have been placed around the sites storm water management and reviewed after each event. This non-compliance is a replication of a historic EPL non-compliance and has since been managed to the satisfaction of the EPA.	Compliant	No action required.

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
		by Section 147 of the POEO Act 1997). To help reduce the likelihood of future non-compliances, a Wet Weather and Stormwater Management work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. Since the implementation of the new work instruction, no further sediment rich discharges have occurred. Council consider that these are historic results and that Council has implemented amended controls to eliminate recurrence, noting that controls implemented are performing as designed. Though the above situation has been reported by WCC through the EPL Annual Report for 2016-2017, the exceedance of suspended solids above the discharge limit is noted as non-compliant to this condition.	**Recommendation**: Continue to review the effectiveness of corrective actions applied to site water management and address any further non compliances as required	During the 2017/2018 monitoring period (29 May 2017 to 28 May 2018), controlled releases of uncontaminated stormwater occurred on ten occasions with standing water level, turbidity and pH measured and validated prior to each release. Prior to each release, pH measured between 6.4 to 8.5, and TSS was below 50 mg/L.		
Sch 4 Condition 18	The Proponent shall prepare and implement a Soil, Water and Leachate Management Plan for the project in consultation with Council, NOW and the EPA and to the satisfaction of the Secretary. This plan must be prepared and implemented by a suitably qualified and experienced person and be approved by the Secretary prior to the	Process to manage the soil, water and leachate is defined in Section 7.3 of LEMP with reference to future works as per detailed design report for ongoing Package 2 and 3 landfill cell. The LEMP was prepared by Golders and approved by DPE on 11/12/14. Implementation: Evidence of implementation was noted in the monitoring of groundwater, surface and leachate water. Maintenance of leachate pond and water treatment facility was also noted.	Compliant	Chapter 7.0 of the LEMP was prepared in response to the original Schedule 4, condition 18 requirements. The LEMP was prepared by Golder Associates and approved by DPE on 11 December 2014. The LEMP is currently being updated to account for MOD 2 works. Evidence of implementation of soil, water and leachate management and maintenance of leachate pond	Non-compliant	Update LEMP Within three months of submitting Annual Review

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
	commencement of operation.			and water treatment facility has been noted.		
Sch 4 Condition 18d	The plan must include: d) a stormwater management plan that: • is updated to the satisfaction of the Secretary, prior to the construction of works associated with MOD 2, to ensure the stormwater design is in accordance with Whytes Gully Resource Recovery Park - Eastern Gully Stormwater Report prepared by Golder Associates, Report Number 1528284-054-R-Rev0, Dated September 2017.	Condition not assessed by Independent Auditor	Not assessed	The LEMP is in the process of being updated by Golder Associates and is yet to be submitted to the Secretary for approval.	Non-compliant	Update LEMP Within three months of submitting Annual Review

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 4 Condition 18e	The plan must include: e) an on-going surface water, groundwater and leachate monitoring program that includes (but is not limited to): a commitment to provide the results of monitoring to NOW and other relevant government agencies every 12 months.	WCC did not provide evidence that results of monitoring are reported to NOW and other relevant government agencies every 12 months, hence compliance with this aspect of the condition was not verified.	Not Verified **Recommendation**: Provide results of monitoring to Crown Lands and Water (formerly NOW) and other relevant government agencies every 12 months as required of the condition.	WCC would like to confirm with DoP what Government agencies monitoring data must be provided to and at what frequency	Compliant	Copy of EPA annual return and monitoring results provided to Crown Lands and Water in March 2019.
Sch 4 Condition 23	The Proponent shall ensure the project does not cause or permit the emission of any offensive odour (as defined by the POEO Act).	No offensive odour was noted at the time of the first site inspection during calm, and sunny conditions. A deodoriser was observed to be in operation during the first site visit. However, during the second site visit, some odour was observed up slope of the tipping face on the high point of the landfill, which was downwind at the time of the inspection. The odouriser was not in operation during the second site visit. There did not appear to be a process for specific management of	Not Verified **Recommendation**: WCC to ensure that odouriser is in operation as required to minimise the risk of offensive odour going off site. It is recommended that WCC review the implementation of the procedure regarding the use and placement of the odouriser.	WCC conducts odour monitoring at the tip face throughout the day. Two odour abatement systems (deoderisor trailers) are used as well as application of cover material to manage odour. Proactive odour inspections are conducted weekly in the Farmborough Heights area by Council staff. Monitoring inspections are lodged in an excel report and distributed to the team. Inspections are carried out by various staff.	Ongoing	Continue odour monitoring program and ensure it is communicated to all relevant personnel.

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
		the face during these more adverse wind conditions. It was noted that the tipping face was being kept small and cover was being used during both site inspections. Minutes of the Whytes Gully Reference Group meeting on 24 May 2017 indicated that one member "mentioned the smell in the morning when the lids are lifted. It was advised that the deodoriser trailer is turned on prior to site start up to minimise odour generated. Another member mentioned that sometimes the smell is as late as 10:00am." No mention of odour was made in the Minutes of the Whytes Gully Reference Group meeting on 22 November 2017. Selected incident reports were provided by WCC for odour complaints on 24 November 2016 (1 complaint); 6 March 2017 (4 complaints); and 17 March 2017 (4 complaints). The reports showed that complaints are followed up with weather data and other factors documented. The EPA issued a letter to WCC dated 30 March 2017 responding to a letter from WCC dated 21 March 2017 in relation to odour complaints made in March 2017. The EPA noted that the identified the cause of the complaints relates to a premises not under the control of WCC. Given the audit site inspections were of limited duration, it was not possible to fully assess compliance	**Recommendation**: It is recommended that WCC conduct additional odour monitoring to re-assess the potential for odours during southerly winds and assess if existing controls are adequate to prevent off site odours. Based on the outcomes of the monitoring, additional controls may be warranted.			

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
		with this condition and hence is considered Not Verified.				
Sch 4 Condition 30c	The Proponent must develop and implement a Greenhouse Gas Management Plan prior to the commencement of operation of the new landfill cells. This plan must include, as a minimum: c) include a program to monitor the effectiveness of these measures, and a protocol to periodically review the plan.	WCC reported that greenhouse gas emissions are monitored continuously and reported via a contract provider monthly to assess the effectiveness and efficiency of the landfill gas management system. The effectiveness of the system is reported quarterly to Council as part of Council's annual plan. Internal annual sustainability reporting is also conducted which includes an annual review of greenhouse gas emissions at the landfill and assesses opportunities to implement further energy and greenhouse gas emissions improvements. An example action from the energy use review has resulted in the installation of solar photovoltaic energy at the Whytes Gully site. The solar photovoltaic system is now operational. This system was not sighted by Auditors. WCCs Annual Report includes the following text on page 20: "Greenhouse gas emissions reduction projects: This program is	Non-Compliant **Recommendation:** WCC to review the LEMP and subplans to: assess the extent of implementation; assess the effectiveness of the landfill gas management system and energy saving measures; and update the plan to address current site practices.	In late 2018 Council tendered for the installation and operation of a landfill gas management framework for Whytes Gully Resource Recovery Park. The scope of this tender was to significantly increase gas capture at the site and to utilise capture landfill gas for energy generation. Council is currently (March 2019) working with a preferred provider and contracts are expected to be awarded by May 2019.	Non-compliant - A Greenhouse Gas Management Plan will be developed by the successful tenderer as part of the implementation process. This has not yet been developed.	Develop Greenhouse gas management plan as part of the implementation process of the LFG system. Update LEMP and provide meaningful reporting of greenhouse gas / carbon abatement actions. Within three months of submitting Annual Review

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
		helping to reduce Council's greenhouse gas emissions by establishing and delivering an array of projects that provide carbon abatement. Various projects that have the potential to reduce Council's carbon footprint were progressed during the year. The largest project under way was the Whytes Gully landfill gas capture and flaring project which successfully stopped approximately 660 tonnes of methane gas from being released into the atmosphere. Other carbon abatement projects including solar photovoltaic cell installations and high efficiency lighting upgrades were also completed." No review of the plan has been conducted since the LEMP was developed in 2014. WCC did not demonstrate how they have assessed the effectiveness of energy saving measures. Based on the information provided, WCC are not compliant with part c of the Condition.				
Sch 4 Condition 31	The Proponent shall ensure that the noise generated by the operations on site does not exceed the criteria in Table 6 at any private residential receiver.	Appendix M of the LEMP – Noise Management Plan defines noise mitigation and monitoring required. The Plan does not require noise monitoring to be conducted specifically for operations, however does require Contractors to conduct noise monitoring during construction activities. Noise monitoring assessments were conducted during construction, and noise monitoring reports for construction were provided. The	Compliant	The Project Approval states that noise monitoring is required to occur at the properties of five residential receivers, as identified in Appendix 6 of the Project Approval. Noise monitoring at WGRRP commenced in early February 2019 and a standard operating procedure has been developed.	Compliant - Noise monitoring points are mapped and conducted once a month. A report is completed following completion of monitoring, these are soft	Convert reports into electronic format to reduce the risk of reports being or lost or misplaced.

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
		reports indicated that noise criteria were not exceeded for periods of construction. During these periods operations were ongoing, hence it is considered the monitoring is likely to be useful in verifying compliance to this condition.			copy reports and not electronic	
Sch 4 Condition 34 (Modification 1)	The Proponent shall prepare and implement a Noise Management Plan for the project in consultation with the EPA and to the satisfaction of the Secretary. The plan must: a) be prepared and implemented by a suitably qualified and experienced person whose appointment has been approved by the Secretary; b) be approved by the Secretary prior the commencement of construction; c) describe the measures that will be implemented to minimise noise from the construction and operation of the project and ensure:	The plan was prepared by Golder Associates. The Plan was approved by DPE as part of the LEMP on 11/12/2014. Measures are described in the plan. Refer to discussion for Condition 32.	Compliant	A Noise Management Plan has been prepared by Golder Associates, and was approved as part of the LEMP by DPE on 11 December 2014, and as part of the CEMPF on 20 August 2013. The Noise Management Plan is currently being updated to include the required modifications.	Non-compliant (Underway) – Noise Management Plan has not been updated by Golder Associates, to be included as part of the sites LEMP.	Update Noise Management Plan Commence immediately

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
	• best management practice is employed on site; • implementation of traffic noise management measures; • the noise impacts of the project are minimised during adverse meteorological conditions; and • compliance with the relevant conditions (including noise limits) of this approval.					
	g) be updated and resubmitted to the Secretary for approval within three months following the approval MOD 1. The CNMP shall be updated prior to the commencement of the conditions of any such approval; and	Condition g was not assessed by the Independent Auditor	Not assessed	The Noise Management Plan is in the process of being updated by Golder Associates and will be submitted to the Secretary for approval.	Non-compliant (Underway) – Noise Management Plan has not been updated by Golder Associates, to be included as part of the sites LEMP.	Update Noise Management Plan Commence immediately
	h) include management and mitigation measures developed in consultation with the sensitive receivers identified in Appendix 6.	Condition h was not assessed by the Independent Auditor	Not assessed	The Noise Management Plan includes management and mitigation measures in Section 3.4.5, however states in Section 3.4.7 that negotiated agreements would be commenced prior to construction of the appropriate stage of the Project with the affected community. WCC have not advised that this consultation has occurred.	Non-compliant (Underway) – Noise Management Plan has not been updated by Golder Associates, to be included as part of the sites LEMP.	Consultation with sensitive receivers Commence immediately

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 4 Condition 36	The Proponent shall ensure that c) the project does not result in any vehicles queuing on the public road network; d) heavy vehicles and bins associated with the project do not park or stand on local roads or footpaths in the vicinity of the site; e) all vehicles are wholly contained on site before being required to stop;	No queuing of vehicles noted during the site audit, however it was indicated that some waste trucks are likely to queue on the road outside the facility before 7:30 am waiting for the site and weighbridge to be opened. Due to the extra lane on the road adjacent to the entrance to the facility, trucks are able to queue and not obstruct local traffic. During operating hours, there is room for vehicles to queue on site prior to having to stop. Consultation with RMS did not identify any traffic related issues relating to WCC Operations in this location. Auditors did not observe trucks queuing on public roads, and hence were unable to verify from observation the extent and nature of queuing on public roads. Hence auditors were not able to verify if WCC are not compliant with sub conditions c, d and e.	Not Verified **Recommendation**: That WCC manage the road in accordance with the condition. Alternatively, confirm with RMS that current arrangements related to trucks parking outside the facility prior to opening is acceptable, and notify DPE of the outcomes of this consultation	WCC has raised this issue at its Traffic Committee and as a result No stopping signs have been placed along the roadway outside WGRRP. Additionally, a letter has been sent to commercial customers reminding them not to queue in front of WGRRP prior to opening of the site.	Ongoing – Signage is now enforceable and fines can be distributed to truck drivers to continue to stop no stopping areas. This has seen an improvement in traffic conditions.	Continue to implement traffic control measures.
Sch 4 Condition 44	The Proponent shall submit to the Department a report detailing compliance with Conditions 42 and 43 one month prior to the commencement of operation.	Evidence of reporting requirements as per this condition was not sighted or provided to the auditors.	Non-compliant **Recommendation:** That WCC submit to the Department a report detailing compliance with Conditions 42 and 43; or alternatively discuss the requirement with DPE and determine another approach to meet DPE's requirements.	Not submitted prior to operation	Non-compliant	Discuss with DPE to see what alternatives there are to meet this requirement Commence immediately

Sch 4 Condition 45	The Proponent shall: a) implement suitable measures to manage pests, vermin and declared noxious weeds on site; and b) inspect the site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in surrounding area. Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Noxious Weed Act 1993	During the site inspections, numerous weeds including noxious weeds were evident across the site. Current weed controls appeared limited and was not able to be explained in detail by WCC. Based on site observations, weed controls measures across the site were not adequate or effective. WCC reported that the site is inspected monthly and control undertaken periodically derived from inspection results. Implementation records provided included: 1) a schedule of weed management visits for all of council's sites. This indicated site visits on 7 occasions were scheduled over 2017; 2) emails discussing various weed areas and requesting weed control services during 2016 and 2017; WCC did not demonstrate that a systematic and through approach is taken to management and control of weeds at the site. Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013). A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outlined in Biosis (2013), to satisfy the condition criteria outlined	Non-compliant **Recommendation**: Implement the controls in the program as defined by Biosis for pest, vermin and noxious weeds management.	WCC has engaged several contractors to assist with vegetation and pest species management at the site including Southern Habitat and Soil Conservation. A number of practical steps have been taken to manage pest species including slashing and spraying of noxious weeds in a number of locations across the site. Targeted deer culling. Removal of dead trees used as habitat by Ibis and proper use of cover material at the tip face to minimise exposed waste. Additionally, bait stations are in place around the perimeter of buildings and are serviced regularly to manage rodents .	Ongoing – Improved daily cover by trialling Con-Cover to further reduce pest and vermin. Biosis has been egage to conduct pre-clearance surveys and the split is spit into zones to effectively manage. Requsts for quotes have been sent out by WCC for vegetation management for each zone. Biosis has been engaged to conduct a revie of vegetation management for the site.	Implement vegetation management plan based on review from Biosis Improvements to pest species management and noxious weed control to continue. Commence Immediately.

		in the VMP to date. These management actions are proposed to be undertaken within a 12-month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works. WCC provided a screen shot of records for Wild Dear Operation - Feral Animal Control - Whytes Gully with latest record dated 24, 25, 26 October 2017. Given the extent of weeds across the site, WCC are considered not compliant with this condition. Implementation of the control measures defined by Biosis will go towards addressing compliance issues with this condition.				

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 4 Condition 46	The Proponent shall: a) Implement suitable measures to minimise the risk of fire on site, including in the landfill area b) extinguish any fires on site promptly; and c) maintain adequate fire-fighting capacity on site.	WCC had conducted an emergency evacuation drill on January 2017. The LEMP defined the firefighting management strategy and capacity. WCC indicated that no fire had been reported since 2013. The Auditors are not Fire experts and have not assessed WCC's ability to manage fires at the site or compliance with this condition. OFI: WCC conduct a review of their capability to manage fire risk and maintain adequate fire-fighting capacity on site.	Not assessed	Section 9.9 of the LEMP outlines the firefighting management strategy and capacity. There have been several small fires within the waste transfer station area and at the tip face. A fire occurred at the tip face in the early hours of Monday 4th March 2019. This fire was attended to by FRNSW, RFS and Council staff and was quickly contained with no damage to council infrastructure or the surrounding environment. The EPA were notified and attended the site. A number of minor changes were made to Councils Pollution Incident Response Management Plan as a result of the debrief. Records are available of related debriefs. There is evidence of testing/tagging of fire extinguishers and records of drills/training of staff.	Compliant – Recent fire in March 2019 triggered a review of PIRMP. Incident report submitted to EPA. Warden training sighted.	Continue to conduct warden training on an annual basis. Involve local fire service to participate in training. Implement changes to PIRMP following outcome of meeting. Further seek ways to mitigate risk of fires on site.

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 4 Condition 49 (Preparation)	The Proponent shall prepare and implement a Vegetation Management Plan for the project to the satisfaction of the Secretary. This plan must:	The initial Vegetation Management Plan was included in the LEMP which was approved by DPE on 11/12/14.	Compliant	A Vegetation Management Plan was initially prepared as part of the LEMP (Appendix O) and CEMPF (Appendix C) in August 2013. This plan has been updated by Biosis to address the requirements of Modification 2. The updated Vegetation Management Plan is dated July 2017, however has not yet been sighted by Cardno. Weed management at the site is ongoing with several contractors engaged by Council to regularly inspect and treat infested areas.	Ongoing - Biosis has been engaged to conduct a review of vegetation management for the site.	Continue to implement Vegetation Management Plan for the site. Implement vegetation management plan based on review from Biosis
	b) be updated and approved by the Secretary within six months of determination of MOD 2 or prior to the commencement of construction, whichever is sooner;	The initial Vegetation Management Plan was included in the LEMP which was approved by DPE on 11/12/14.	Preparation: compliant	The initial Vegetation Management Plan was included in the LEMP which was approved by DPE on 11/12/14. However, there is no evidence of the updated Vegetation Management Plan being submitted to the Secretary.	Non-compliant	Submission of updated VMP to DPE Commence immediately
	d) must specifically include a Biodiversity Offset Strategy that: • details the proposed offset measures to be implemented and secured for removing and/or impacting 0.49 hectares of native vegetation (including 0.01 hectares of Illawarra Subtropical Rainforest) relating to project approval MP	Preparation: compliant	Preparation: compliant	Section 4.2 outlines the proposed offset measures for the 0.49 hectares of native vegetation. However, detailed offset measures for 0.25 hectares of native vegetation relating to MOD 2 have not been detailed.	Non-compliant	Update VMP Commence immediately

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
	11_0094 and 0.25 hectares of native vegetation (Illawarra Subtropical Rainforest) relating to MOD 2;					
	f) incorporate the recommendations of the Whytes Gully landfill Modification: Flora and Fauna Assessment, prepared by Biosis, project number 20115, dated 11 October 2017; and	Condition not assessed by Independent Auditor	Not assessed	The initial Vegetation Management Plan did not include these recommendations, however the plan is currently being updated to incorporate necessary information.	Non-compliant	Update VMP Commence immediately
	g) details the site-wide ecological management and monitoring program/s to be implemented for the life of the project.	In 2017, WCC required an updated assessment of the current condition of the vegetation within the study area and the maintenance required to meet the performance criteria to date as outlined in the VMP (Biosis 2013). Performance criteria 'to date' was based on the assumption that the proposed works program would currently be in year four, if the VMP had been implemented in 2014. A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been	Non-compliant	Table 3 outlines the vegetation management zones, objectives, actions and performance criteria for each of the zones. Broader ecological management and monitoring is adequately discussed in Section 3 of the VMP. While not sighted by Cardno, the Independent Auditor reviewed the report by Biosis 2017 which provided an updated assessment of the current condition of vegetation in the study area. This report detailed the results of field investigations including	Non-compliant	Implementation of management recommendations Commence immediately

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
		formulated based on the requirement for each management zone, as outline in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12 month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works.		vegetation condition assessments, and the provision of management recommendations. management actions proposed in the updated report were proposed to be undertaken within a 12 month period.		
Sch 4 Condition 49 (Implementation)	The Proponent shall prepare and implement a Vegetation Management Plan for the project to the satisfaction of the Director-General.	Implementation: Based on the issues related to weeds identified above in Condition 45; and outcomes of the Biosis report where more stringent weed actions are defined to be required, WCC are considered to be Non Compliant with the implementation of the weed controls measures identified in the Vegetation Management Plan.	Non-compliant (Implementation) **Recommendation**: It is recommended WCC implement weed controls as defined in the Vegetation Management Plan. **Recommendation**: That WCC complete the implementation of the Vegetation Management Plan in full (in addition to weed management as defined above) and in regard to Offsets as detailed in the Vegetation Management Plan. **Recommendation**: Report progress in implementation of the VMP in Annual	WCC has a weed crew regulary visit the site to remove and posion non native vegetaion. WCC will implement and improve the Vegetation Management Plan in full and report back in the next report.	Non-compliant (Implementation)	Implementation of improved management measures Commence immediately

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
			Environmental Reports.			
Sch 5 Condition 2i	The Proponent shall prepare and implement a Construction Environmental Management Plan for the project to the satisfaction of the Director-General. The Plan must: i) Be placed on Council's website within 2 weeks of its approval	The copy of the CEMPF or contractor CEMP were not posted in WCC website.	Non-compliant **Recommendation:** It is recommended that WCC place the CEMPF on the WCC website.	The CEMPF has been placed on the WCC website.	Compliant	No actions required.
Sch 5 Condition 3h	Prior to the commencement of operation, the Proponent shall update the draft Landfill Environmental Management Plan in the EA for the site to the satisfaction of the Director- General. This plan must: h) be placed on Council's website within 2 weeks of its approval.	At the time of the audit site inspections (hence for the audit period), the Draft LEMP was posted in DPE website, and the final LEMP was not posted on the WCC website, hence at the time of the audit WCC were not compliant with this condition. As of 26 February, the Final LEMP was located on the WCC website.	Non-Compliant	The LEMP has been listed on the Wollongong Council Website.	Compliant	No actions required.

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 5 Condition 4f	The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: f) a protocol for periodic review of the plan.	The requirement for periodic review is documented in the LEMP and CEMPF. Based on discussions with WCC, annual reviews of the LEMP and CEMPF were not conducted. The latest version of the LEMP and CEMPF were dated 2014. Following issue of the Draft Report, WCC indicated that they consider completing the checklist provided in Section G of the EPL Annual Return as a review of the adequacy of the LEMP and CEMPF.	Non-Compliant **Recommendation**: Implement a formal review process for the LEMP and CEMPF. Where relevant and based on the findings of the review, update the LEMP.	WCC have implementated a formal management review to take place prior to the Issue of the Annual Environmental Report.	Non-Compliant	Complete formal review of the LEMP and CEMPF to ensure suitability and adequacy Commence immediately

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 5 Condition 5	One year after the commencement of operation, and annually thereafter, the Proponent shall review the environmental performance of the Project to the satisfaction of the Director-General. This review must: a) describe the operations that were carried out in the past calendar year; b) analyse the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the · relevant statutory requirements, limits or performance measures/criteria; · monitoring results of previous years; and · relevant predictions in the EA; c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	WCC provided Annual Reports that incorporate Annual Returns required under the Environmental Protection Licence for the years 2012-2013 to 2016-2017. The objective of the Annual Report is stated as being required under Condition R1.8 of the EPL which specifies that WCC must provide an Annual Report to accompany the Annual return for the site. The objective does not appear to reflect the requirements of this condition with thin the Project Approval. The Annual Report address some of the requirements of the condition, however, these reports do not consider compliance with the Project Approval nor meet all aspects of this condition. Specifically, the reports do not cover the following aspects of the condition: 5a) describe the operations that were carried out in the last year; - 5b) third bullet point: Provide a comparison of results against the relevant predictions in the EA; or - 5c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; In summary, WCC are compliant with many aspects of the condition, however, the scope of current reports do not address some aspects of the condition.	Non-compliant **Recommendation**: It is recommended WCC increase the scope of the Annual Reports to address all of the requirements of Condition 5 (Schedule 5) specific to the Project Approval.	This Annual Review meets the requirements of this condition. This Annual Review is the first of its kind under the Project Approval since operation commenced in 2013. While the report focuses on covering the period 29 May 2017 to 28 May 2018 to coincide with EPL reporting requirements, it also provides reference to results since project approval on 3 April 2013.	Compliant following approval from DPE	Provide Annual Review to DPE Immediately upon finalisation of the report

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 5 Condition 6a	Within 3 months of the submission of an: a) Audit under Condition 9 of Schedule 5; the Proponent shall review, and if necessary revise the plans and programs required under this approval to the satisfaction of the Director-General.	Not yet applicable at this stage. This is the first audit commissioned by WCC.	Not applicable	Various non-compliances were identified by the first Independent Environmental Audit commissioned by WCC, and to date revision of plans and programs has not been completed as recommended by the audit.	Non-Compliant	Address all non-compliances in this table Commence immediately
Sch 5 Condition 8	The Proponent shall provide regular reporting on the environmental performance of the Project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval, and to the satisfaction of the Director-General.	The following regular monitoring and reporting are posted on the WCC website: • Environmental Protection Licence 5862 - Annual Return • Whytes Gully Groundwater Monitoring -Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring - Conducted annually in August, and after any overflow event caused by rain • Whytes Gully Air Monitoring - Conducted monthly Auditors have not gone through all management plans to ascertain reporting requirements for each plan, and whether they have been included on the website.	Compliant	WCC currently provides regular reporting on environmental performance that includes: Annual Returns as required by the EPL (annual), Groundwater monitoring (annual and quarterly), bores and surface water monitoring (quarterly and annual), surface water monitoring (annual and overflow monitoring), air monitoring (monthly), and dust deposition monitoring (monthly). No noise monitoring provided on website.	Non-Compliant – Air monitoring data has been recorded on a monthly frequency based on the data provided in table 3-3, this may impact the accuracy of the short term criterion for air monitoring requiremetns	Provision of noise monitoring data to website Provide noise monitoring data as soon as the applicable report has been finalised Ensure air monitoring data is recorded on a 24-hour frequency to ensure accuracy of results.

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Sch 5 Condition 9	Within a year of the commencement of operation of the project, and every 5 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the Project.	This audit is the first audit to be commissioned by WCC since Approval for the Project and since Stage 1 operation of new cell commencing in 2014. To comply with this condition an audit was required in 2015. An independent environmental audit was not conducted a year after commencement of operation of Stage 1, hence WCC are non compliant with the timing related to this condition.	Non-compliant	Noted. An Indepednent Environmental Audit will be scheduled in 2023 unless the Director General directs otherwise.	Non-Compliant	Schedule an Indepednent Environmental Audit In the year 2023 i.e. five years following the initial audit
Sch 5 Condition 11c	From the commencement of construction of the project, the Proponent shall make the following information publicly available on its (Council's) website as it is progressively required by the approval: b) a copy of the current plans and programs required under this approval;	The LEMP and CEMPF were not posted on the WCC website at the time of the site inspections and hence WCC are considered as non compliant with this condition. As of 26 February, the documents were sighted on the website. All complaints are logged into Councils Customer Request Management System 'Pathways'. Complaints are reported to the community via the annual returns which are published on our website. WCC have a complaints form in the LEMP, however, evidence of the use of this form was not provided by WCC and an Environmental Incident Report form was sighted for complaints.	Non-compliant **Recommendation**: It is recommended that a register of complaints, updated monthly, is provided on the WCC website.	A register of complaints has been listed on the website and is updated monthly.	Compliant	No action required.
			OFI: Update the LEMP with the form being used by WCC for the recording of complaints.	WCC has listed the LEMP and CEMPF on the Wollongong Council website.		
Sch 5 Condtiion 11g	From the commencement of construction of the project, the Proponent shall make the following information	EPA Annual Returns were posted on the WCC website.	Compliant	The Independent Environmental Audit 2018 has been uploaded to the WCC website, however WCC's responses to the	Non-compliant	Upload WCC's responses to website Within one month of completion of responses and provision to DoP

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
	publicly available on its (Council's) website as it is progressively required by the approval: f) a copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit; and			recommendations have not been uploaded.		
Statement of Commitment	If the Project is approved, it is proposed that Wollongong City Council would surrender existing development consents of relevance to the Project site. This does not include the existing development consent for the MRF, which is not affected by the Project.	Refer to Schedule 3; Condition 7.	Non-compliant	All of the relevant DA consents have been surrendered by the 27th March 2018. This appears to be a duplicated noncompliance with Sch3 Con7	Compliant	No actions required.
Statement of Commitment	All mobile equipment would be selected to minimise noise emissions. Equipment would be fitted with silencers and be in good working order.	Plant and equipment maintenance checklist and records provided.	Compliant	WCC hosts regular meetings with surrounding residential neighbours. Noise from the WGRRP is not an issue that is raised regularly. The SVTS and active tip face are several hundred metres from the nearest residential receiver and the natural landform provides a level of noise attenuation.	Compliant – Meetigns are held every 6 months and minutes are published with the community consultation group.	To be monitored

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
				In recent years a number of noise generating activities have commenced at neighbouring properties including a concrete batching plant and vehicle storage depots. Regular maintenance of equipment is performed throughout the year.		
Statement of Commitment	Broadband reversing alarms would be used for all site equipment.	Broadband reversing alarms were used as observed during audit inspection.	Compliant	WCC confirmed that no broadband reversing alarms are currently used on plant at the site.Plant and Equipment are installed with standard beeping alarms.	Non-compliant	Install low frequency reversing alarms on all plant Within three months of finalising this Annual Review

Condition Number	Condition	IEA Comments and Evidence Sighted for Audit Period	IEA Compliance Status and Recommendation	WCC Response	Annual Review Compliance Status	Actions and Timeframe
Statement of Commitment	Wollongong City Council commit to: Screen planting with dense tall tree planting on natural ground would be used to block views to the site, particularly from adjoining residences.	Landscape strategy is documented in the LEMP. Section 4 of the Landscape Strategy states that "the proposed planting along sections of the site boundary is intended to provide visual screening of the landfill operations from adjoining properties. In order to fulfil this function, the planting will need to be carried out in advance of landfill operations. A minimum of 5 years growth will be required to provide the intended visual screening. WCC did not provide evidence of where trees have been planted for screening purposes. Minutes of the Whytes Gully Reference Group meetings on 24 May and 22 November 2017 indicated questions from members as to why screening trees had not been planted at the boundary of the site.	Non-compliant **Recommendation**: WCC to conduct screen planting with dense tall tree planting on natural ground to block views to the site, particularly from adjoining residences.	Screeing trees have been planted along the front boundary along Reddalls Rd to provide additional screening of the site from residential neighbours. .	Ongoing – Sighted by phots's and plans from WCC. Screening is not yet complete.	Continue to complete screen planting . Within one month of finalising this Annual Review

5.1.2 Recommendations

Table 5-2 summarises the recommendations made in the Independent Environmental Audit (**Appendix D**) with regards to the Project Approval MP11_0094 and Statement of Commitments. Many recommendations are based around continuous improvement opportunities identified during the audit and do not necessarily represent immediate potential non-compliance issues.

Table 5-2 Recommendations from Independent Environmental Audit

Conditions of Project Approval	Opportunities for Improvement (OFIs)
Sch 3 Condition 2d	WCC should consider the compliance implications of the approval instrument MP11_0094 covering areas not under the direct control of the landfill operations (Lot 52 DP 1022266 and Lot 51 DP 1022266) and under the control of other entities. The audit did not consider activities or operations on these Lots nor did it consider any related compliance implications.
Sch 4 Condition 5	The effectiveness of the resource and recovery measures was not able to be fully reviewed during this audit and satisfaction of the Director General was not evident. It is recommended that WCC review the effectiveness of the resource recover measures to fully meet this condition.
Schedule 4 Condition 7g	This audit did not fully review the implementation of all SOPs developed by WCC. It is recommended that WCC conduct an internal audit/review of all the SOPs to ensure ongoing implementation and compliance.
Schedule 4 Condition 7h	It is recommended that WCC conducts an audit of filling activities regularly to demonstrate that it is being implemented to comply with this requirement and the EPL.
Schedule 4 Condition 15g	It is suggested WCC consult with DPE so as to define what is required to obtain or demonstrate “satisfaction of the Director General” for surface water management.
Schedule 4 Condition 18b	Ensure ERSED controls are replaced promptly after works near drainage lines and stabilise the bank of the sediment pond near the outlet and.
Schedule 4 Condition 27	WCC conduct a review of implementation of the LEMP and SOPs in respect to tipping areas to demonstrate compliance with the figures in Table 5 for the areas of tipping face; daily cover; and 90 day cover.
Schedule 4 Condition 32	Ensure all plant use low frequency reversing alarms.
Schedule 4 Condition 34e	It is recommended that WCC conducts a review of the implementation of the noise management plan for operations and construction to ensure compliance to this condition. WCC to address the requirement of the condition to “evaluate and report on the effectiveness of the noise management system”.
Schedule 4 Condition 46	WCC conduct a review of their capability to manage fire risk and maintain adequate fire-fighting capacity on site.
Schedule 5 Condition 2	The Construction Environmental Management Plan has not been updated since 2013. It is suggested that WCC review and update the plan to ensure its alignment with changes on site; and relevant EPL variations.
SOCs	It is suggested WCC consider better advising of the complaints line to WCC on Whytes Gully related web pages and other media, to make it more transparent how complaints to the facility can be made.

5.2 Environmental Protection Licence 5862

5.2.1 Non-compliances and Not Verified Conditions

Table 5-3 provides details of non-compliances in light of the requirements of the EPL 5862 identified during the Independent Environmental Audit (MCW Environmental Consulting, March 2018), and the actions that have been completed or are being completed to ensure compliance.

Table 5-3 IEA Non-Compliances and Not Verified Conditions - Environmental Protection Licence 5862

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status and Recommendation	WCC Response	Action and Timeframe
L.2.1	For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	Based on the monthly reports posted in WCC council and annual returns to EPA, there were 3 occurrences of non-compliances reported to EPA since 2013 against this condition: • L2.1/L2.4 - Exceed TSS Concentration Limit at LDP1 (x1, minor) after a heavy rainfall event on 25/08/2015 (approximately 150mm over 24hours). Action taken by licensee. EPA has written to licensee regarding non-compliance and relevant action. (1 occurrence); • L2.1/L2.4 -Exceed limit for TSS at LDP 1 (minor) on 2 occasions due to high intensity rainfall events in June and July 2016. The licensee is addressing non-compliances. EPA has written to licensee regarding non-compliance and relevant action. (2 occurrences). Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. WCC consider these are historic results and that it has implemented amended controls to eliminate	Non-compliant **Recommendation**: It is recommended that WCC continue to monitor the effectiveness of the controls defined in the Wet Weather and Stormwater Management work instruction and implement additional mitigation measures as required.	This non compliance has been reported to the EPA and additional processes and procedures have been placed around the sites storm water management and reviewed after each event. This non-compliance is a replication of a historic EPL non compliance and has since been managed to the satisfaction of the EPA.	No action required

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status and Recommendation	WCC Response	Action and Timeframe
		recurrence. WCC consider that controls implemented are performing as designed. Specifically, a Wet Weather and Stormwater Management Work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. Since the implementation of the new work instruction, there were no further reported elevated TSS discharges. There was no reported exceedance to the water/land concentration limits since July 2016. Based on the exceedences of the criteria as reported, WCC is assessed as Non compliant with this condition. Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. It was not evident that these events were reported to the EPA based on documents sighted.			
L4.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.	Refer to Sch 4 Condition 23.	Not Verified. Refer to recommendations made in the MCoA Checklist for Conditions 23 and 26; Schedule 4.	Suitable odour suppression methods are currently implemented at the site and the trend for odour related compaints is downward. Odour monitoring will be undertaken in an attempt to improve performance.	Additional odour monitoring trial to determine the source and timing of odour generation and consideration of suitable corrective actions Commence immediately

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status and Recommendation	WCC Response	Action and Timeframe
O6.8	The licensee must not exhume any landfilled waste unless approved in writing by the EPA.	The process of exhumation of the landfill is defined in the LEMP. Two Penalty Notices (1521880 and 1521881) were raised on 22 May 2014 regarding exhumation of waste: O6.4 -Non-compliance with Condition O6.4 - The licensee must not exhume any landfilled waste unless approved in writing by the EPA. Penalty Notice issued. WCC consider this to be an historic incident for which Council has implemented amended controls to eliminate recurrence. Controls implemented are performing as designed. WCC has not exhumed any landfilled waste unless approved in writing by the EPA since this event in 2014. An approval for exhumation of waste for the removal of rainflap was granted in October 2017. Given the events in 2014, WCC were not compliant with this condition at this time. Since May 2014 it is considered that WCC has been compliant with the condition hence no recommendation is made.	Non-compliant	This non compliance has been reported to the EPA and additional processes and procedures have been placed around the the area of waste exhumation. Since 2014 this has not occurred since. This non-compliance is a replication of a historic EPL non compliance and has since been managed to the satisfaction of the EPA. This consent condition is a replication of EPL conditions.	No action required.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status and Recommendation	WCC Response	Action and Timeframe
O7.3	Disturbed areas must be provided with separate water quality controls for the treatment of runoff containing suspended or turbid pollutants.	During the audit inspections, it was observed that generally disturbed areas within the operation facilities were spray grassed or covered with geofabric. Swales or drainage were generally lined with gravel, and sand bags or check dams were also placed within the swales. However, limited erosion and sedimentation controls were noted within the construction areas of cells 2 and 3 and at the newly constructed leachate pond (see photos below). The lack of controls in these areas was reported by WCC to have been from recent construction activities conducted in and adjacent to the drainage line. Issues on this area were also noted in the Whytes Gully Inspection November 2017 Report prepared by the WCC surveillance officer from the public works division. WCC noted that since the site inspection, it has and continues to address these issues with the construction contractor on the site. A stop work order was issued in October 2017 and rectification implemented before work could recommence. Performance management of the contractor is ongoing.	Non-compliant **Recommendation**: That WCC and its contractors review the processes for installation of ERSED controls in construction areas and ensure that controls are effective and placed promptly after works are completed.	WCC has been working closely with the construction team to ensure that the ERSED controls are adequate. The ERSED controls discuss exist internal to the site. Councils discharge of stormwater has not been over the EPL limit.	Management of contractors environmental performance Ongoing

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status and Recommendation	WCC Response	Action and Timeframe
R4.1	The licensee must maintain a daily log and record the following data of fires at the site: a) Time and date when the fire was deliberately started or reported. b) Whether the fire was authorised by the licensee, and, if not, the circumstances which ignited the fire. c) The time and date that the fire ceased and whether it burnt out or was extinguished. d) The location of fire (eg. clean timber stockpile, putrescible garbage cell, etc). e) Prevailing weather conditions. f) Observations made in regard to smoke direction and dispersion. g) The amount of waste that was combusted by the fire. h) Action taken to extinguish the fire.	Two fires were recorded in the WHS records management system. Register of events were provided for WWARRP from 2013 to 2017. The fires occurred on 31-7-2013 and 21-8-2013. The system did not report fires after this event. The system indicated that the first fire was reported to the EPA, and a separate email indicated that the second fire was also reported to the EPA. The data provided to auditors did not address all of the requirements of the conditions a to h. As such, Auditors were not able to verify compliance with this condition.	Not Verified **Recommendation**: It is recommended that WCC record all details as defined in the condition relating to fires at the site and ensure that the EPA are notified of details of fires occurring on site as defined in the condition.	WCC has reviewed the incident form for fires and will make amendments to expressively ensure all individual conditions are included in the report template.	Update indicent form Commence immediately
R4.2	The licensee or its employees or agents must notify the EPA in accordance with conditions R2.1 and R2.2 of all fires at the premises as soon as practical after becoming aware of the incident.	See response to above condition R4.1.	Not Verified	WCCs incident process includes a prompt to to call the EPA for all relevant incidents, which is completed as required.	No action required.

5.2.2 Recommendations

5.2.2.1 Independent Environmental Audit

The following recommendations were made in the Independent Environmental Audit (**Appendix D**) with regards to EPL 5862:

- Condition M5.2:
  - It is recommended that WCC review the on line complaints process on the WCC website to specifically include a means of making a complaint for Whytes Gully direct to WCC, rather than the EPA.
  - It is recommended that WCC improve signage at the site to better advertise the complaints line telephone number so that the impacted community knows how to make a complaint.

5.2.2.2 EPL Annual Report 2017/18

The following actions were recommended in the 2017-2018 EPL Annual Report (Cardno 2018) with respect to surface water and groundwater:

- Surface Water
  - Contaminant detections at stormwater sampling Points 1 and 33 could be the result of interference from runoff originating at Reddalls Road as opposed to the Site. Furthermore the surface water bodies were stagnant at the time of sampling and releases of stormwater and leachate did not occur during the reporting period. It is suggested that the sample collection point for Point 1 be relocated upstream to a point between Reddalls Road and the Site boundary (if possible) to eliminate the risk of cross contamination. Given that an elevated concentration of ammonia was reported in Point 33 and a pH of 9.7 was measured at Point 1, the results should be monitored closely during future monitoring events to confirm if the unusual results were anomalous or indicative of potential leachate interaction with stormwater bodies.
- Groundwater
  - The laboratory limit of reporting was above the adopted screening criteria for several contaminants including PAHs, OCPs and OPPs. Future analysis of these contaminants should be undertaken at an ultra-trace level to ensure the limit of reporting is below the applicable criteria.
  - Consideration should be given to completing the annual groundwater sampling earlier during the reporting period to allow a greater opportunity to collect samples. The annual event was scheduled for February 2018 and monitoring wells 9, 12 and 13 were dry. These wells are located in the higher elevations of the site along the northern and western boundary and provide important data showing groundwater contaminant concentrations up-gradient of the tip face. Conducting the annual sampling event earlier during the reporting period will allow alternate opportunities for sampling in the event of dry wells being encountered.
  - Consideration should be given to the replacement or removal of EPA groundwater monitoring well 13. The well has been recorded as consistently dry since 2012 with only two records of groundwater interception during monitoring.
  - Historically water samples have been submitted for laboratory analysis of total heavy metals in accordance with EPL 5862. Water samples should also be analysed for dissolved metals (ie filtered) to determine if elevated metals are attributed to sediment or if they exist in dissolved phase.

5.3 Management Plans

5.3.1 Non-compliances

The LEMP, CEMPF and IOMP and their various sub-documents outlined various monitoring requirements for the site. Compliance with the monitoring requirements identified in the LEMP, CEMPF and IOMP have been addressed in **Appendix B**. A number of non-compliances were noted in this compliance review as outlined in **Table 5-4**, as well as actions proposed to ensure compliance**.**

Table 5-4 Management Plan Non-compliances

Document	Section	Non-compliance	Actions and Timeframes
LEMP	4.3	Evidence that all staff are trained in the requirement to notify and record any public complaint.	Document staff competency / commence immediately
	5.3	Site survey of waste measurement and recording completed twice per year.	Survey and measurement of waste sighted and routine surveys are completed.
	5.3	Weighbridge certification completed annually.	Document certification / commence immediately and complete annually thereafter
	5.6	Clear signage indicating location and availability of high pressure water cleaner.	Erect necessary signage / within two months of finalising the Annual Review
	5.6	Random audit of trucks leaving the site for cleanliness.	Conduct a random audit of trucks departing the site / at least one audit undertaken at a time decided by WCC
	6.2	Employment of a full-time supervisor other than the compactor driver to supervise tipping	WCC to consider employing a full time supervisor to supervise tipping / within two months of finalising the Annual Review
	6.2	SOP developed for the Small Vehicles Transfer Station	Prepare SOP for Small Vehicles Transfer Station / within one month of finalising the Annual Review
	6.4	Ongoing access waste compaction with compactor survey system	Assess compaction with compactor survey system / within two months of finalising the Annual Review
	6.4	6 monthly review of compaction data.	Review compaction data / every six months
	7.2.1	Regular earthworks monitoring and testing during construction to ensure quality assurance.	Quality assurance monitoring during construction / at least weekly
	7.2.2	Regular monitoring during construction to ensure Quality Assurance.	Quality assurance monitoring during construction / at least weekly
	7.2.2	Inspection of leachate pump and pond operation, weekly and daily after rainfall.	Inspect leachate pump and pond operation / weekly and daily after rainfall
	7.2.2	Preventative maintenance of Leachate pumps, biannual with full overhaul every 3 years.	Maintenance of leachate pumps / biannually and full overahaul every three years
	7.2.2	Quarterly inspection of leachate ponds including liner integrity.	Inspect leachate ponds / quarterly
	7.2.2	Daily inspection of irrigation area prior to irrigation.	Inspect irrigation areas / daily prior to irrigation

	7.2.3	Inspection of surface water reed beds and surface water polishing ponds, quarterly and after rainfall events.	Inspect surface water reed beds and polishing ponds / quarterly and after rainfall events
	7.2.3	Inspection of storm water diversion drains, quarterly and after rainfall events.	Inspect storm water diversion drains / quarterly and after rainfall events
	7.2.4	Quarterly inspection of integrity of leachate ponds.	Inspect leachate ponds / quarterly
	7.2.4	Daily monitoring leachate pond levels and LTP operation.	Monitor leachate pond levels and treatment plant / daily
	7.2.4	Monthly maintenance of leachate management system.	Maintenance of leachate management system / monthly
	7.6	The flow meter shall be accessible to Sydney Water for inspection.	The Sydney Water flowmeter can be accessed via the Innaco Leachate Treatment Plant compound at Whytes Gully and at the Sydney Water Compund adjacent to the Helensburgh Site. Access to the flow meters is arranged via appointment with WCC staff.
	8.2.3	Stockpiles of combustibles, fuels and flammable solvents stored inspected for fire risk on a quarterly basis.	Stockpile inspections / quarterly
	8.3.1	Bushfire maintenance inspection annually and during bushfire season.	Bushfire maintenance inspection / annually and during bushfire season
	9.2	Weekly perimeter inspection of fence condition.	Perimeter fence inspection / weekly
	9.5	Visual observation for when pest/vermin/weed species seem to be increasing.	Pest, vermin and weed inspection / ongoing
	9.5	Bait stations for vermin.	Establish bait stations for vermin / as required
	9.5	Quarterly noxious weed survey by site staff.	Noxious weed survey / quarterly
	9.5	Trapping program for pest and vermin, as required.	Pest and vermin trapping / as required
	9.7	Noise attenuation devices should be installed on all equipment on site.	Noise attenuation on all equipment / as soon as practicable Note: noise attenuation devices are only required on plant that produce excessive noise
	9.8	Continuous observations on traffic flow.	Observations of traffic flow / ongoing
	9.9	Firefighting mitigation measures outlined in Section 8.2.3 for bushfire protection should be implemented.	Bushfire protection / as required
	9.9	Inspection of fire extinguishers (by contractor)	Fire extinguisher inspection (external) / biannual
	9.9	Inspection of fire extinguishers (by Waste Coordinator or Leading Hand)	Fire extinguisher inspection (internal) / quarterly
	9.9	All firefighting equipment and facilities shall be checked for damage/condition	Firefighting equipment damage / condition assessment / quarterly
	9.9	All firefighting equipment and facilities shall be test operated	Firefiighting equipment and facility test operated / quarterly
	9.9	Check fire equipment signposted to Australian standards and accessibility	Check fire equipment signposting / quarterly
	9.9	Review capacity of fire fighting	Review capacity of firefighting / quarterly

	11.1	Record of fires, as required	Maintain record of fires / as required and following all fire events
	11.1	Incident reporting, as required	Maintain record of incidents / as required and following all incidents
CEMPF	3.2.4	Contractor to complete water quality monitoring	Water quality monitoring / quarterly
	3.2.4	Daily water quality monitoring of protective works, their performance, the extent of any maintenance, need for additional works.	Cell no longer in construction
	3.2.4	Hourly water quality monitoring of protective works, their performance, the extent of any maintenance, need for additional works throughout major storm events.	Cell no longer in construction
	3.2.4	Water quality monitoring of protective works, their performance, the extent of any maintenance, need for additional works prior to commencement of work following >1mm rainfall.	Cell no longer in construction
	3.4.5	Periodic noise monitoring at nominated sensitive receivers at the start of construction activites.	Noise monitoring / at the commencement of construction works
	3.4.5	Periodic noise monitoring at nominated sensitive receivers on a monthly basis while significant noise generating activities are being undertaken.	Noise monitoring / monthly while significant noise generating activities are being undertaken
	3.4.5	Ongoing spot checks of noise intensive plant and equipment at the commencement of project and throughout construction.	Spot checks of plant and machinery noise / at commencement of project and ongoing
	3.4.5	Details of site activities and equipment usage for each monitoring event	Ensure any equipment used in monitoring events is recorded / ongoing
	3.6.4	A waste management monitoring program shall be conducted by the Contractors at the site throughout the construction period.	Waste management monitoring program / ongoing
	3.7.4	A contamination management monitoring program shall be conducted by the Contractors at the site throughout the construction period.	Contamination management monitoring program / ongoing
	3.8.4	A hazardous materials monitoring program shall be conducted by the Contractors at the site throughout the construction period.	Hazardous materials monitoring program / ongoing
	7	The contractor is responsible for reporting on progress of implementation of the CEMP throughout construction. The Contractor should prepare a report for any milestones established in each individual monitoring plan as well as regular progress meetings with the Site Superintendent.	Progress reporting of CEMP implementation / monthly

	9	The Contractor shall undertake internal audits once each month to verify compliance with this CEMP and the Contractors CEMP.	Internal audit of CEMP audit / monthly
CEMPF Appendix A: Construction Traffic Management Plan	5.2	A daily inspection before the start of construction activity should take place to ensure that conditions accord with those stipulated in the plan and there are no potential traffic hazards.	Traffic hazard inspection / daily prior to the start of construction activity
CEMPF Appendix C: Vegetation Management Plan	3.10	The monitoring program should be carried out by the bush regeneration contractor or a suitably qualified and expericenced restporation ecology consultant.	Vegetation monitoring program / ongoing
	3.10.2	Establishment of photo points within one month of the award of the contract	Establishment of photo points / within one month of project award
	3.10.2	Quarterly photographic monitoring over a five year period.	Photographic monitoring / quarterly over a five year peiod
	3.10.3	Annual reporting for five years	Reporting on vegetation monitoring / annually for five years
	3.11.1	Further consultation regarding a conservation agreement for all areas proposed for environmental restoration works within this VMP, and a voluntary joint agreement between WCC and OEH is recommended.	For consideration
IOMP Landfill Gas Management System	Various	All monitoring requirements are currently unverified.	Contract with Run Energy will meet this requirement.
IOMP Asset Management Plan	4.2	All monitoring requirements are currently unverified.	Asset Management Plan is updated to represent an activities taking place at the facility / annually
IOMP Site Safety, Emergency and Business Continuity Management Plan	3.2.5	ongoing training requirements will be reviewed on an annual or as-needs basis.	Review of training requirements for safety, emergency, business continuity management plan / annually or as required
	3.2.5	Council shall organise preparation of new SOPs and review of existing SOPs as required	Review of existing SOPs / annually
	3.2.6	Council to conduct health and safety inspections, and a record kept	Health and safety inspections / minimum quarterly
	3.2.6	Safety inspections should be carried out during maintenance schedules	Safety inspections during maintenance / as required
	3.2.6	Inspection of services performed by contractors to confirm compliance with SWMS	SWMS compliance inspections / minimum quarterly

	3.2.6	Leachate treatment plan inspection	Leachate treatement plant inspection / Monthy inspections.
	3.2.6	Inspection and testing as per Council's checklist Z11/104392	Inspection and testing as per checklist Z11/104392 /. Monthly inspections.
	3.2.7	Compliance audit to ensure that changes to the OH&S legislation are being met and current management plan is effectve in its goals.	OH&S legislation compliance audit / annually
	3.2.7	OHS inspections using checklist in Appendix E	OHS inspections using Appendix E checklist
IOMP Fraud Prevention and Control Plan	3.4	Review of transactions, recording and reporting to assess complaince with, and review applicability of the performance requirements specified in this report	Performance review of transaction, recording and reporting compliance / Underway – WCC to be audited after completion and submission of this report.

5.3.2 Independent Environmental Audit

Table 5-5 summarises the recommendations made in the Independent Environmental Audit (**Appendix C**) with regards to the Management Plans for the site. Many recommendations are based around continuous improvement opportunities identified during the audit and do not necessarily represent immediate potential non-compliance issues.

Table 5-5 Recommendations relating to management plans

Document or Area of recommendation	Recommendations
LEMP and CEMPF	▪ WCC review approaches to site based management systems and the integration of these with the LEMP. ▪ WCC review current approaches as defined in the LEMP and CEMPF against the requirements of formal EMS Standards (such as a Gap Analysis) to ascertain what current approaches may be missing in terms of an overall system approach, and whether WCC could benefit from implementation of such approaches. ▪ WCC conduct regular audits of the implementation and adequacy of the LEMP; Contractors CEMPs; the CEMPF and other WCC systems to ensure ongoing implementation and effectiveness of controls.
LEMP	▪ That the LEMP and associated sub-plans be reviewed and updated as required and ensure their effectiveness and adequacy. Technical aspects of the review should be undertaken by suitably qualified people. ▪ That the LEMP update include a rationalisation of documents appended to the LEMP to make it a more manageable sized document and to remove aspects of the document now not considered relevant. This could include that various design related documents being uploaded to the WCC website separately, instead of being appendices to the LEMP. ▪ The LEMP and associated subplans are required to be posted on the WCC website. ▪ That key requirements of the LEMP be reflected in operating level systems and procedures.
CEMPF	▪ That the CEMPF and its associated sub-plans be reviewed and updated as required and ensure implementation and effectiveness on construction works. ▪ The CEMP and it's associated subplan be posted on the WCC website. (noted this recommendation was implemented during the audit report finalisation).
Vegetation Management Plan	▪ Update the Vegetation Management Plan with the findings of the review of the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2017).
Pollution Incident Response Management Plan (PIRMP)	▪ Update PIRMP based on review from fire occurring in March 2019 to ensure effectiveness during incidents that require the activation and use of the PIRMP

5.4 Complaints

Actions for non-compliances relating to odour complaints (in response to EPL L4.1) are discussed in **Section 4** for Project Approval Schedule 4 Conditions 23-26.

5.5 Actions required at previous Annual Review

As this is the first Annual Review for the project in accordance with the project approval, there are no applicable actions.

6 Conclusion

This Annual Review identifies all approval and licence conditions for the Whytes Gully Waste and Resource Recovery Park, and details the compliance status of each condition. The Review also meets the specific Annual Review requirements in Major Project Approval MP11_0094 Condition 5 of Schedule 5.

This Annual Review is the maiden report since WCC received approval from the Department of Planning. In preparing the document Cardno considered all available historical data in order to determine compliant and non-compliant conditions.

In general, it is considered that WCC have undertaken appropriate actions to manage its environmental impacts with the overall objective of not causing unacceptable environmental harm. It is acknowledged that numerous non-conformances of the conditions of approval have been identified during the Review, but despite this, the environmental performance, project quality and health and safety of workers and surrounding receptors has been maintained to an acceptable standard through conscious and attentive operational management practices. WCC are committed to improving the project performance and the recommendations of this Review will provide a basis to address the identified shortcomings.

This Annual Review will be provided to the Department of Planning and other stakeholders as obligated by the conditions of approval. This Annual Review does not raise significant concerns regarding the ongoing ability of WCC to comply with environmental requirements in the Major Project Approval, Environmental Protection Licence 5862 and other regulatory requirements, but does identify areas for improvement that will be rectified progressively to the satisfaction of regulatory stakeholders.

7 References and Abbreviations

7.1 References

ANZECC (2000), Australian Water Quality Guidelines, 2000

Cardno (2018), Whytes Gully Landfill Annual Report 2017-2018, prepared for Wollongong City Council.

Australian Standards (1999), AS 4482.2-1999 Guide to the Sampling and Investigation of Potentially Contaminated Soil - Volatile Substances, 1999

Golder Associates (2012), Geotechnical Investigation, Whytes Gully Landfill, 2012

Golder Associates (2014), Landfill Environmental Management Plan, Whytes Gully Landfill, 2014

MCW Environmental Consulting (2018), Independent Environmental Audit – Whytes Gully Landfill Extension Project.

NEPC (2013), National Environment Protection (Assessment of Site Contamination) Measure, 2013

NHMRC (2014), Australian Drinking Water Guidelines, 2014)

NSW EPA (1996), NSW Environmental Guidelines: Solid Waste Landfills, 1996

NSW EPA (2013), Requirements for publishing pollution monitoring data, 2013

NSW EPA (2015), Asbestos and Waste Tyre Guidelines, 2015

NSW EPA (2016), Environmental Guidelines: Solid Waste Landfills (Second Edition), 2016

NSW DPI (1985), 1:100,000 geological map Wollongong-Port Hacking, 1985

Sydney Water (2017), Consent to Discharge Industrial Trade Wastewater, 2017

US EPA (2000), Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations, 2000

Wollongong City Council (2013), Whytes Gully Waste Disposal Facility – Annual Report 01 June 2012 – 31 May 2013.

Wollongong City Council (2014), Whytes Gully Waste Disposal Facility – Annual Report 01 June 2013 – 31 May 2014.

Wollongong City Council (2015), Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot) - Annual Report 29 May 2014 – 28 May 2015.

Wollongong City Council (2016), Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot) - Annual Report 29 May 2015 – 28 May 2016.

Wollongong City Council (2017), Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot) - Annual Report, Period 29 May 2016 – 28 May 2017.

7.2 Abbreviations

AQMP: Air Quality Management Plan

ANZECC: Australian and New Zealand Environment and Conservation Council

CCC: Community Consultative Committee

CoA: Condition of Approval

Council: Wollongong City Council

DA: Development Application

DPE: Department of Planning and Environment

EA: Environmental Assessment

EIS: Environmental Impact Statement

EC: Electrical Conductivity

EEC: Endangered Ecological Community, as defined under the NSW *Threatened Species Conservation Act 1995*

EMP: Environmental Management Plan

EMS Environmental Management System

EP&A Act: *Environmental Planning and Assessment Act 1979*

EP&A Regulation: *Environmental Planning and Assessment Regulation 2000*

EPL: Environment Protection Licence

ESCP: Erosion and Sediment Control Plan

IEA: Independent Environmental Audit

INP: Industrial Noise Policy

Land: Land means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval

Minister: Minister for Planning, or delegate

NMP: Noise Monitoring Program

NOW: NSW Office of Water (adopted certain responsibilities of DWE from July 2009)

OEH: Office of Environment and Heritage (formerly Department of Environment,

DECCW: Department of Climate Change and Water

PA: Project Approval

Project: the development as described in the EA

REF: Review of Environmental Factors

RMS: Roads and Maritime Services

SEE: Statement of Environmental Effects

SoC: Statement of Commitments The Proponent's commitments in Appendix 1

TSS: Total Suspended Solids

WGLEP: Whytes Gully Landfill Extension Project

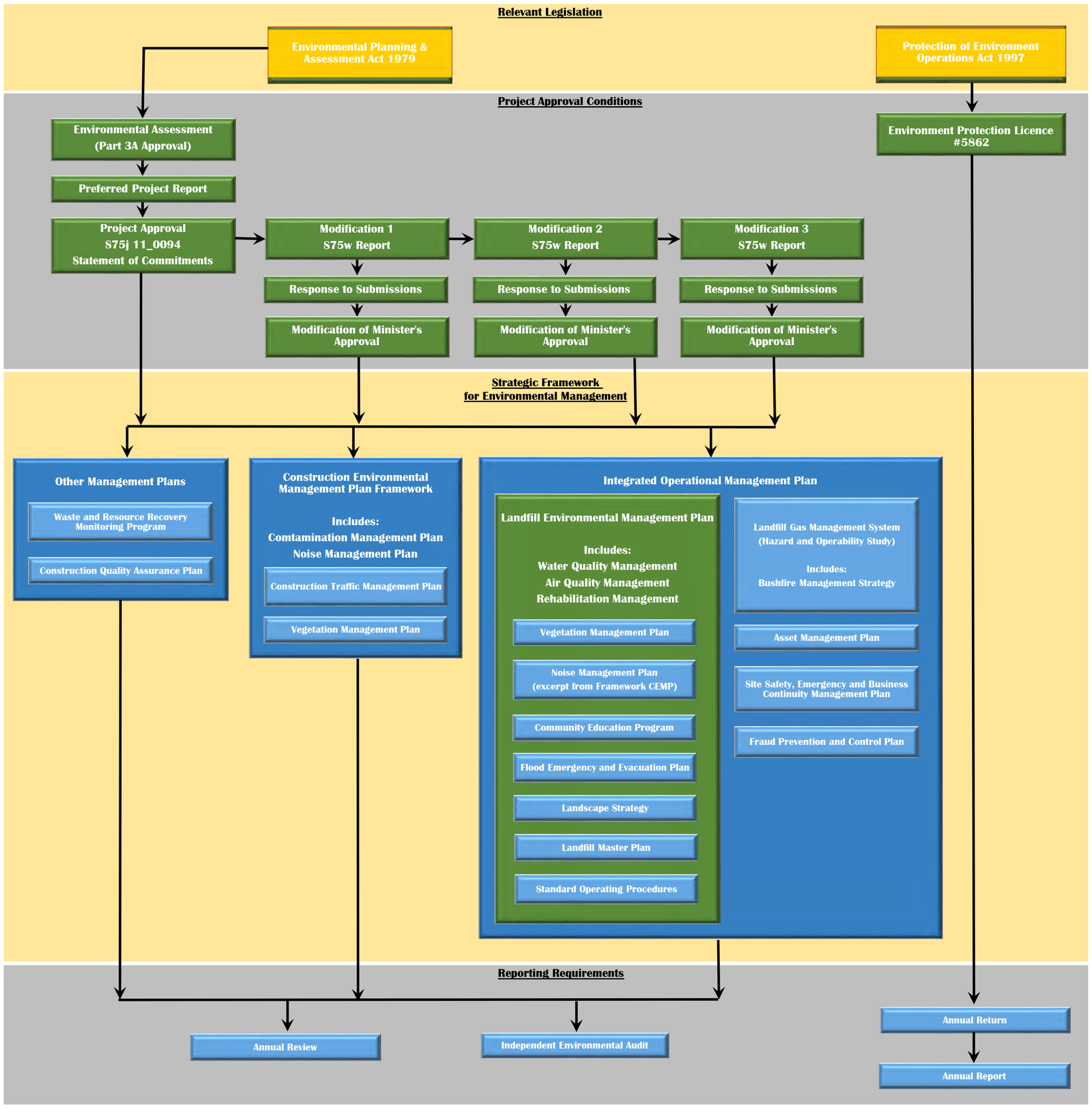
WWARRP: Wollongong Waste and Resource Recovery Park

Project Approval MP11_0094

APPENDIX A

PROJECT APPROVAL COMPLIANCE TABLE

Environmental Management Structure



	No action required OR action is completed
	Cardno action required
	Della Kutzner action
	Other Council department action
	Golder confirmation required

WHYTES GULLY LANDFILL EXPANSION PROJECT - Minister's Condition of Approval 11_0094			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
Schedule 3 - Administrative Conditions			**MCW Environmental Consulting Pty Ltd, March 2018**			**Cardno, December 2018**		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Findings**	**Compliance Status & Recommendation**
Obligation to minimise harm to the environment	1	The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation or decommissioning of the Project.	Interview with Waste Manager and Construction Manager and Site inspection 11 September and 27 November 2017 Documents and records provided to auditors	WCC have developed the environmental management plans LEMP and CEMPF with associated subplans and procedures for Whytes Gully Landfill Extension Project as per the requirements of Minister's Conditions of Approval defining the mitigation measures to prevent and or minimise any harm to the environment during construction and operations. These plans were also approved by the Department of Planning for implementation. Stage 1A & 1B construction was completed in 2014. Operation of the Stage 1 Cell commenced in 2014 and was 70% filled at the time of this audit. Based on information provided by WCC, and observations made during site inspections, and subject to the findings in this report, WCC has generally implemented the reasonable and feasible measures to prevent and/or minimise any harm to the environment. There were no reported incident that cause material harm to the environment. Where non compliances to the conditions of approval have been identified, these are discussed below within this table and in the main body of the report.	Compliant, (subject to the findings for specific conditions as defined in this table).	Meeting with WCC on 2 August 2018 and 10 August 2018. Documents and records provided by WCC	Wollongong City Council (WCC) have developed the Landfill Environmental Management Plan (LEMP), Construction Environmental Management Plan Framework (CEMPF) and associated subplans and procedures as part of the requirements of the Minister's Conditions of Approval, and these plans have been approved by the Department of Planning and Environmental (DPE) for implementation. These documents provide mitigation measures for the prevention and minimisation of harm to the environment during construction and operation of the Whytes Gully Landfill Extension Project. WCC has generally implemented the mitigation measures contained in the LEMP and CEMPF where reasonable and feasible. Stage 1A & 1B construction was completed in 2014, and during the reporting period, Cell 2 was being constructed. Operation of the Stage 1 Cell commenced in 2014 and was 70% filled at the time of this review. There have been no reported incidents that are likely to cause material harm to the environment at the site since commencement (April 2013). Non-compliances to the conditions of approval are discussed in this appendix (Appendix A) and in the body of the Annual Review.	Compliant (subject to the findings for specific conditions as defined in this table).
Terms of approval	2	~~The Proponent shall carry out the project generally in accordance with the:~~		(Discussed in Modification 2 table)			(Omitted due to Modification 2, discussed in Modification 2 table)	
	~~(a)~~	~~EA;~~						
	~~(b)~~	~~PPR;~~						
	~~(c)~~	~~Statement of Commitments (see Appendix 1);~~						
	~~(d)~~	~~site layout plans and drawings in the EA (see Appendix 2); and~~						
	~~(e)~~	~~conditions of this approval.~~						
	3	If there is any inconsistency between the above, the conditions of this approval shall prevail to the extent of any inconsistency.		The lot number noted in the EA Figure 6.1 is Lot 1 DP 240557, however in the MCoA and EPL it is Lot 2 DP 240557. The lot and DP noted in the MCoA and EPL will prevail.	Note		Noted	Not applicable
	4	The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:		WCC have received approval for the various management plans required of the project approval. WCC did not identify or provide any documents that included.	Compliant		WCC received approval for the various management plans required of the project approval. WCC noted that no requirements from the Director-General were received arising from DPE's assessment of the various management plans.	Compliant
	(a)	any reports, plans, strategies, programs or correspondence that are submitted in accordance with this approval; and						
	(b)	the implementation of any actions or measures contained in these reports, plans, strategies, programs or correspondence.						
Limits of approval	5	The Proponent shall ensure that no more than 180,000 tpa of waste is accepted at the landfill in any calendar year.	Whytes Gully tonnage data - waste and recycling Weigh bridge data TPA Weighbridge Data – to March 2018 Operational Purpose Deduction – Certificate	WCC report tonnages to the EPA on a monthly basis as a requirement of Council's Environment Protection Licence. The EPA review this data monthly and audit the data as required. The tonnages are collected via a weighbridge system that is calibrated annually. Additionally, this information is verified via stocktake surveys completed for the site which are executed by a registered surveyor. WCC provided a Whytes Gully tonnage data spreadsheet – waste and recycling register to record the type of waste received, recycled and disposed offsite. While this was provided and reviewed, the auditors were not able to establish how the total tonnage accepted at the landfill in any calendar year is calculated by WCC. WCC provided a further spreadsheet (TPA Weighbridge Data provided 29-3-18) that summarised the waste tonnages for 2014 to 2018. This data provided a total of waste accepted at the facility, and subtracted the following: wastes taken off site including green waste; Operational Purpose Deduction (materials bought to site for other purposes e.g. construction materials); and non waste related items e.g. consumable products. The data provided by WCC reported the following totals of waste (in tonnes per annum) to landfill was: 2014 was 54,743 tonnes; for 2015 was 120,330 tonnes; 2016 was 106,981 tonnes; and for 2017 there was 133,144.04 tonnes recorded as going to landfill. WCC provided an Operational Purpose Deduction – Certificate from the EPA for the construction of Landfill Cells 2 & 3 and Leachate Pond/Drainage. This provided an exemption of 167,649.40 tonnes of materials. Based on the data supplied by WCC and the Operational Purpose Deduction applied by WCC, the data indicates compliance with the condition. MCW Environmental has not verified; nor completed an independent check on the methodology used by WCC to measure and calculate the waste numbers as reported.	Compliant	Whytes Gully tonnage data - waste and recycling Weigh bridge data TPA Weighbridge Data – to May 2018 Operational Purpose Deduction – Certificate	Wasteman' program is used to track incoming and outgoing wastes at the site. WCC reports tonnage received by the site to the EPA on a monthly bases as per the Council's Environment Protection Licence (EPL). The total tonnage per year has been below the waste limit for each calendar year.	Compliant
	6	This approval does not authorise any landfilling activities or new landfill cell to be constructed or operated within the area marked Stage 4-2B in the PPR and shown in the staging plan in Appendix 3 of this approval.	Site inspection	Observations during the site inspection confirmed that no landfilling or construction has commenced in the area marked Stage 4-2B. The photo below of the site taken during the audit shows no activities in the Stage 4-2B area.	Compliant		WCC confirmed that no landfilling has occurred in Stage4-2B as indicated in Appendix 3 of the approval during operation.	Compliant
Surrender of existing development consents	7	Within 12 months from the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall surrender the development consents identified in Table 1 in accordance with Sections 75YA and 104A of the EP&A Act.	Surrender of Development Consent documents dated 13 March 2018 Applications to surrender Development Consents dated 7 February 2018	At the time of the audit site inspections, WCC could not demonstrate that they had surrendered the previous development consents. On 29 March 2018, WCC provided documents showing that WCC surrendered all of the leases detailed in Table 1 on the leases on 13 March 2018, except for DA 1996/8256 and DA-1996/6256. The surrender of leases followed an application to surrender the leases dated 7 February 2018. One the basis that the Development Consents were not surrendered within 12 Months of the date of the Approval (being 3 April 2013); and that surrender of two development consents may be outstanding; WCC is considered noncompliant with this condition. Recommendation: Ensure that development consents DA 1996/8256 and DA-1996/6256 are surrendered in accordance with Condition 7: Schedule 3.	**Non-compliant**		WCC confirmed that all development consents listed in Table 1 have been surrendered on 13 March 2018.	Compliant
	8	To the extent of any inconsistency between the consents identified in Table 1 and this approval, this approval shall prevail.	Conditions of Approval 11_0094	Previous DA's were not provided to the Auditors hence this condition was not assessed.	Noted - Not Assessed		Noted	Not applicable
Transitional arrangements	9	All existing environmental management plans that apply to the site under those DAs listed in Table 1 of this Schedule shall continue to be fully applied until replaced under this approval.	LEMP Sep 2014 CEMPF August 2013	WCC reported that during the transition period until the approval of the Landfill Environmental Management Plan (LEMP) in 2014 and Construction Environmental Management Plan Framework (CEMPF) in 2013, all existing management plans prevailed. This audit has not considered the management plans under the DA's listed in Table 1. Due to the time elapsed since the commencement of the LEMP and hence replacement of the former management plans, it was not possible to verify whether the plans were in place until replaced under this approval.	**Not Verified**	LEMP - Sep 2014 IOMP - Feb 2015 CEMPF - June 2016	WCC confirmed that all environmental management plans currently in use (LEMP, CEMPF and associated subplans and procedures) have been prepared in light of the Project Approval.	Compliant

WHYTES GULLY LANDFILL EXPANSION PROJECT - Minister's Condition of Approval 11_0094			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
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Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Findings**	**Compliance Status & Recommendation**
Structural adequacy	10	The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures are constructed in accordance with the relevant requirements of the BCA.	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015.	WCC reported that no new permanent buildings have been constructed under the approval. The project has comprised the construction of new landfill cells. At the time of this audit New Cell Part 1A and 1B were completed (in 2014). Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence against this condition. Auditors have relied on the Completion Reports and Practical Completion Certificates completed by third parties to demonstrate compliance with this condition for Part 1A and 1B of the landfill. No further assessment has been undertaken in respect of this condition.	Compliant		WCC confirmed that all construction activities have been in accordance with the relevant requirements of the BCA. At the time of this Annual Review, new landfill cells Part 1A and 1B have been completed. While Cardno did not sight the Completion Reports and Practical Completion Certificates for this work, the Independent Auditor confirmed that these components were constructed in compliance with this condition.	Compliant
Retaining Walls	11	The Proponent shall ensure that:		WCC reported that no retaining wall was included in Landfill Cell Part 1A & 1B. No retaining walls were observed during the site inspections.	Not triggered		WCC confirmed that a retaining wall (push wall) was constructed at the Community Recycling Centre as part of the Project. The design and construction of this retaining wall was in accordance with the Project Approval.	Compliant
	(a)	All retaining walls are designed by a suitably qualified civil or structural engineer and are detailed on engineering plans which meet the requirements of WCC; and						
	(b)	Following the completion of construction of any retaining wall, a certificate from a suitably qualified civil or structural engineer is obtained to verify the structural adequacy of the retaining wall.						
Demolition	12	The Proponent shall ensure that all demolition work is carried out in accordance with Australian Standard AS 2601:2001: The Demolition of Structures, or its latest version.	Work Plan Methodology Demolition dated 15-1-2014 – Blackwell Brothers	Demolition works were completed in 2013-2014. A Work Plan Methodology Demolition dated 15-1-2014 was sighted for the demolition of the weighbridge and the office structures. The work pan referenced the Australian Standard AS 2601:2001: The Demolition of Structures, in addition to a number of other relevant standards and codes. On this basis WCC are considered compliant with this condition.	Compliant		WCC confirmed that a carport was demolished as construction works (Ertech). Demolition works were completed in 2013-2014, which included the demolition of a weighbridge and office structures. While Cardno did not sight documentation associated with this works, the Independent Auditor confirmed that this work was completed in accordance with this condition.	Compliant
Operation of plant and equipment	13	The Proponent shall ensure that all plant and equipment used for the project is:	Plant Daily Inspection Matrix Whytes Gully Waste Asset Maintenance Records John Deer Loader Maintenance Daily site inspection - Leachate Ponds; Ammonia Plant; Settling Ponds & weighbridge	WCC provided the plant and equipment maintenance record register as evidence of compliance for this requirement. An example of Daily site inspection - Leachate Ponds; Ammonia Plant; Settling Ponds & weighbridge was provided as evidence dated 21/08/17. An example of Waste Asset Maintenance Records 2015 included the following waste assets: - AE79SP Komatsu PC 220-7 (P94401) - IVECO STRALIS 8x4 Hook truck (93701) - BG91EH Caterpillar Loader 950H (P95212) - Caterpillar Compactor 836H SERIES (P94242) - Water pump at Whytes Gully Tip 94/95 year Given the extent of the nature of this condition, not all aspects of the maintenance and operation of plant and equipment used on site was able to be assessed. The assessment has been based on the documents provided and listed and based on the minor nature of the few incidents that have been reported to have occurred on site.	Compliant	Standard Operating Procedures - Appendix H IOMP	WCC operational staff have a responsibility to maintain equipment to ensure correct operation and efficiency. WCC ensure all personnel are suitably qualified, trained and competent to ensure equipment is operated in a proper and efficient manner. Plant and equipment are regularly inspected and scheduled for maintenance at the WCC workshop. All plant and equipment used for the project is maintained and oeprated in a proper and efficient manner, in accordance with Appendix H Standard Operating Procedures (IOMP) for the site. While Cardno did not sight documentation to confirm that plant and equipment are maintainted and operated property and efficiently, the Independent Auditor confirmed that plant and equipment were maintained and operated in accordance with this condition.	Compliant
	(a)	maintained in a proper and efficient condition; and						
	(b)	operated in a proper and efficient manner.						
Protection of public infrastructure	14	The Proponent shall:		WCC reported that no public property damage occurred during the audit period.	Not Triggered		Council has a commitment to maintaining public infrastructure at the site, which includes roads, power and telecommunication infrastructure. During the reporting period, Council have repaired roads and relocated power and telecommunication infrastructure where required.	Compliant
	(a)	repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and						
	(b)	relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.						
Staged submission of plans or programs	15	With the approval of the Director-General, the Proponent may submit any plan or program required by this approval on a progressive basis.	June 2012 VOLUME I - Environmental Assessment - Whytes Gully New Landfill Cell	The staging of the project was defined in the Environmental Assessment that was submitted to DPE. The Stage 1 Plans have been submitted and approved by DPE comprising the LEMP and CEMPF and their associated subplans. Stage 2 commenced in March 2017 and will be completed mid-2018.	Noted	VOLUME I - Environmental Assessment - Whytes Gully New Landfill Cell - June 2012 LEMP - Sep 2014 IOMP - Feb 2015 CEMPF- June 2016	The Environmental Assessment, which defined the staging of the project, was submitted to DPE. Stage 1 Plans have been submitted and approved by DPE, which include the IOMP, LEMP and CEMPF and their subplans. Stage 2 commenced in March 2017 and is expected to be complete mid-2018.	Noted

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Waste								
Restrictions on receipt, classification and disposal	1	The Proponent shall only receive waste on site that is authorised for receipt by an EPL.	Whytes Gully tonnage data - waste and recycling Weigh bridge data Work Place daily inspection - Small Vehicle Transfer Station - 9112014 - 30112014 Daily inspection Tip Face Example rejected loads report Sept 2016 - Sept 2017	Based on the waste and recycling data supported with the procedures, the landfill only receives waste that is authorised under EPL. The weigh bridge check point was also installed with camera as an additional mitigation measure to ensure wastes accepted are in accordance with the EPL authorised wastes. Excavator and compactor site personnel are also trained to identify materials that are not acceptable at the landfill. Inspection during tipping is also conducted. The auditors did not do any specific inspection to assess compliance with this criteria due to access restrictions at the tip face. Full verification of compliance with this condition is not considered practicable as part of the audit.	Compliant	EPL Annual Report 2017/2018	Condition L3.1 of the EPL 3862 outlines the following waste as acceptable at the site: > General solid waste (non-putrescible) > General solid waste (putrescible) > Asbestos waste WCC confirmed that the site is compliant with the EPL requirements regarding waste streams and only receives waste that is authorised under the EPL. Excavator and compactor site personnel are trained to identify materials that are not acceptable at the landfill, and a camera has been installed at the weigh bridge check point to ensure wastes accepted is in accordance with the EPL requirements. Condition L3.2 of the EPL 3862 states the conditions for which the licencee must not dispose of any tyres on the premises. An Annual Report for the Whytes Gully Waste Disposal Facility was prepared by Cardno on behalf of WCC for the 2017-2018 reporting period of 29th May 2017 to 28th May 2018. This report confirmed that WCC do not dispose of waste tyres at site, but instead receive and temporarily store until they are collected by an external contractor (Tyrecycle Pty Ltd) for recycling.	Compliant
	2	The Proponent shall ensure that any waste generated on the site during construction is classified in accordance with the EPA's Waste Classification Guidelines and disposed of to a facility that may lawfully accept the waste.	Records of offsite disposal of waste during construction -Bingo Fill Disposal summary Whytes Gully tonnage data - waste and recycling	The process for waste classification is defined in the CEMPF. Construction wastes such as concrete, scrap metals, asphalts and hazardous waste (i.e. asbestos, contaminated soil) were classified and went offsite to a licence facility. The Bingo fill disposal summary that included construction demolition wastes was provided as evidence of compliance to this requirement.	Compliant		The process for waste classification during construction is outlined in the CEMPF. While Cardno did not sight evidence supporting, the Independent Auditor confirmed that construction wastes were was classified and disposed of in accordance with this condition.	Compliant
Resource recovery	3	The Proponent shall implement all reasonable and feasible measures to recover resources from the waste stream to the satisfaction of the Director-General.	WOLLONGONG WASTE AND RESOURCE RECOVERY STRATEGY 2022 ACTION PLAN WWRRP flyer to community Whytes Gully tonnage data - waste and recycling Register	Flyers are provided to community on proper waste sorting prior to disposal to landfill and emphasis cost savings on disposing to landfill. The recycling area was set up onsite for residential/community drop off. Tonnage data of waste and recycling register was provided as evidence. WCC plan to recover methane gas in the future. WCC were not able to provide evidence of satisfaction by the Director General with this condition. A full assessment of what reasonable and feasible comprises, in relation to this condition, has not been undertaken as part of this audit.	Compliant	LEMP (Section 5.2 and 5.4) - September 2014	The LEMP outlines waste screening measures (Section 5.2) and recycling measures (Section 5.4) to be implemented at the site. While not sighted by Cardno, the Independent Auditor confirmed that measures to recover resources from the waste stream was compliant with this condition.	Compliant
Screening and acceptance	4	The Proponent must:	Waste Services SOP - Weighbridge Procedure Asbestos Detection & Treatment at Whytes Gully Safe Operating Procedure Placement and Handling of Special Waste - Whytes Gully Waste Services Daily Inspection -Tip Face - Whytes Gully Waste Depot Daily Inspection - Small Vehicle Transfer Station - Whytes Gully Waste Depot Training and Development - Risk Management - Assessment - Waste Services Required Training Matrix Accepting eWaste under the product stewardship program Procedure ewaste, mattresses and tyres, storage and removal – WWRRP Whytes Gully Weighbridge Cash Handling procedures Compliance checklist Whytes Gully Waste Depot weighbridge cash handling procedures Capture Training Records - Sandra Belanszky as example Example rejected loads report Sep 2016 - Sep 2017 SOP - Collection & Removal of bonded asbestos under 10 mtrs	The procedures listed in the "Evidence Source" column were developed and implemented at the site. Implementation Evidence: Prior to entering the landfill, all trucks and cars pass through a weigh bridge and receive dockets. A camera is installed at the weigh bridge as an additional check for waste prior to entering landfill. Staff were trained and sent to TAFE for a waste management course. A Training Register was provided as evidence of records for training. Daily Inspection – Tip face template was provided. A sample of completed forms were provided for review. Daily Inspection – small vehicle transfer station template was provided. A sample of completed forms were provided for review. There was no reported incident of illegal dumping to date. Given the nature of receiving wastes in enclosed trucks, it is not possible to verify this condition with certainty. Auditors have not conducted any on site assessment to test compliance with this condition. However, based on the records provided e.g. Example rejected loads report Sep 2016 - Sep 2017, this implies that WCC has demonstrated it has implemented practices in relation to accepting and rejecting waste at the site.	Compliant	Z16/16284 - Site Management Plan Z16/175510 Tyre tracking procedure	Site Management Plan contains specific directives that emplyees sign onto, including asbestos identification and management. Work instructions exist for medical waste and special waste. While Cardno did not sight evidence of implementation, the Independent Auditor confirmed that the prescribed procedures have been implemented at the site in compliance with this condition.	Compliant
	(a)	implement auditable procedures to:						
		• ensure that the site does not accept wastes that are prohibited; and						
		• screen incoming waste loads; and						
	(b)	ensure that:						
		• all waste that are controlled under a tracking system have the appropriate documentation prior to acceptance at the site; and						
		• staff receive adequate training in order to be able to recognise and handle any hazardous or other prohibited waste.						
Monitoring	5	The Proponent shall prepare and implement a **Waste and Resource Recovery Monitoring Program** for the site to the satisfaction of the Director-General. This program must:	Landfill Environment Management Plan, September 2014 DPE approval letter for LEMP dated 11/12/14. Whytes Gully tonnage data - waste and recycling Register Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July	Section 1.3 of LEMP presented the records of consultation with DPE and EPA.	**Compliant OFI**	LEMP - September 2014 Waste and Resource Recovery Strategy 2012 to 2022 - July 2014	The Waste and Resource Recovery Strategy 2022 Action Plan includes the Whytes Gully Waste and Resource Recovery Park in the general strategy for Wollongong City Council. A Landfill Environmental Management Plan was prepared for the site.	**Compliant OFI**
	(a)	be prepared in consultation with the EPA;					Section 1.3 of the LEMP outlines the consultation completed with DPE and EPA for the preparation of the LEMP.	
	(b)	be approved by the Director-General prior to the commencement of operation;		Record of DPE approval letter for LEMP was provided to the auditor as evidence of compliance to this requirement.			While evidence was not sighted by Cardno, the Independent Auditor confirmed that the LEMP was approved by the Director-General prior to commencement of operation.	
	(c)	detail the screening and acceptance procedures required by Condition 4 above;		The Section 5.2 of LEMP defined the waste screening process.			Section 5.2 of LEMP defined the waste screening process.	
	(d)	monitor:		Defined in operations overview Section 3 and Gate house operations Section 5 of LEMP. Waste recycling process is defined in Section 5.4 of LEMP.			The LEMP outlines the operation of the site in Section 3, gatehouse operation in Section 5, and waste recycling process in Section 5.4. The Waste and Resource Recovery Monitoring Program is defined in Section 5 of the LEMP. While Cardno did not sight evidence of implementation, the Independent Auditor confirmed that the	
		• the quantity, type and source of waste received on site; and						
		• the effectiveness of the resource recovery measures (see Condition 3 above).						

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		This program must be documented in the Landfill EMP (see Condition 3 in Schedule 5).	2014) Whytes Gully tonnage data - waste and recycling LEMP	The Waste and Resource Recovery Monitoring Program is defined in Section 5 of LEMP. This section also defined the inspection, monitoring and maintenance schedule. Implementation Evidence: The evidence of implementation provided largely comprised the Whytes Gully tonnage data - waste and recycling wherein all waste data including the recycling tonnage are recorded. Screen shots of Strategic Waste Research Filing Container was also provided as evidence of WCC demonstration of waste and recovery monitoring program meeting and consultation for improvement and research of new technology. Brochures are also provided to the community on how to proper segregate and recycle wastes prior to disposal to the landfill. A separate recycling area was also set up for community to drop off any recyclable waste prior to dumping into the landfill. The Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014). Project Plan – Increased Diversion of Domestic Waste EOI and Tender Trim Ref: Z15/248910 OFI: The effectiveness of the resource and recovery measures was not able to be fully reviewed during this audit and satisfaction of the Director General was not evident. It is recommended that WCC review the effectiveness of the resource recovery measures to fully meet this condition.			operation of the site was in compliance with this condition.	
Trade waste agreement	6	From the date of this approval, the Proponent shall ensure that a Trade Waste Agreement is in place with Sydney Water for as long as leachate is discharged to sewer.	Landfill Environment Management Plan Section 7.6 MONITORING LANDFILL SITES MASTER Whytes Gully analytical data WWARRP - Sydney Water - Trade Waste Agreement Consent No. 11205 - August 2017	The trade waste agreement under Sydney Water Consent 11205 was in place and parameters required for monitoring were monitored. Data of monitoring were provided in register MONITORING LANDFILL SITES MASTER Whytes Gully analytical data. Auditors did not complete an assessment of compliance with the Trade waste Agreement.	Compliant	LEMP - September 2014 Z18/116664 Trade Waste Agreement Consent No. 11205 - August 2017	The trade waste agreement under Sydney Water Consent 11205 was in place and parameters required for monitoring were monitored. Results from this monitoring was provided in the 2017/2018 Annaul Report to EPA under EPL 5862 and is included in Appendix C of the Annual Review.	Compliant
Landfill operations	7	Unless the Director-General agrees otherwise, the Proponent shall:	Landfill Environment Management Plan Section 6.0 defined the landfill filling operations SOP Z13/54468 Placement and Compaction of Waste EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017	The landfill operations are defined in Section 6 of LEMP.	Compliant	LEMP (Section 6) - September 2014 Z13/54468 SOP Placement and Compaction of Waste	The landfill operations are defined in Section 6 of LEMP.	Compliant
	(a)	minimise the exposed or cleared areas at the landfill;		The cleared areas of the landfill appeared to be what was required to construct the landfill as relevant at the time of the site inspection.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the cleared areas of the landfill were in compliance with this condition.	Compliant
	(b)	progressively revegetate all completed areas of the landfill and stabilise any exposed areas with intermediate cover of at least 0.3 m that are not required for operational purposes for a period greater than 90 days;		There were no completed areas of the landfill at the time of the inspection (relevant to the current approval). Intermediate cover was observed on areas not required for operational purposes at the time of the audit. The site of the oldest cell is now covered with temporary capping and grass cover.	Compliant		WCC confirmed that there are no completed areas of landfill during the reporting period. While not sighted by Cardno, the Independent Auditor confirmed that the landfill was in compliance with this condition.	Compliant
	(c)	ensure intermediate cover areas are revegetated with grasses;		Intermediate cover areas were revegetated with spray grass.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the landfill was in compliance with this condition.	Compliant
	(d)	limit the size of the active tipping face area, waste relocation area, daily cover and 90 day cover areas to minimise dust and odour (see Table 5 of this approval);		The tip face was limited in size and daily cover was placed with compaction of waste implemented as per the SOP Z13/54468. See photo above.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the landfill was in compliance with this condition.	Compliant
	(e)	minimise the tracking of mud and waste from the site on public roads;		No visual tracking of mud from site onto public roads was observed during site audit.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the landfill was in compliance with this condition.	Compliant
	(f)	fill the landfill cells in a systematic manner;		Landfill operational cells were filled in accordance with the standard operating procedure based on the relevant benchmark techniques EPA (1996). At the time of the inspection the waste was being placed systematically up the hill on top of the Piggyback Liner.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the landfill was in compliance with this condition.	Compliant
	(g)	maximise landfill compaction rates;		WCC has developed the SOP Z13/54468 Placement and Compaction of Waste which was claimed used on site. OFI: This audit did not fully review the implementation of all SOPs developed by WCC. It is recommended that WCC conduct an internal audit/review of all the SOPs to ensure ongoing implementation and compliance.	**OFI**		WCC has developed the SOP Z13/54468 Placement and Compaction of Waste which was claimed to be used on site. It was noted by WCC that a CAES system has been installed on the compactor to measure compaction rates, however this has not been functional for approximately two years. Currently, roll-over waste with compactor and extent of compaction is determined by the compactor operator. As recommended by the Independent Auditor, WCC should conduct an internal audit/review of all the SOPs to ensure ongoing implementation and compliance.	**OFI**
	(h)	cover the active landfill area with at least 0.15 m of soil (or a suitable alternative material) at the end of daily waste disposal and compaction activities;		Section 6.5 of LEMP defined the covering of waste as per this requirement and EPL requirement. WCC reported that a cover of fill of 0.15m is placed as daily cover; or steel plates are placed over the active waste filling zone each day. OFI: As above, it is recommended that WCC conducts an audit of filling activities regularly to demonstrate that it is being implemented to comply with this requirement and the EPL.	**OFI**		Section 6.5 of LEMP defined the covering of waste as per this requirement and EPL requirement. WCC reported that a cover of fill of 0.15m is placed as daily cover; or steel plates are placed over the active waste filling zone each day. As recommended by the Independent Auditor, WCC should conduct an audit of filling activities regularly to demonstrate that it is being implemented to comply with this requirement and the EPL.	**OFI**
	(i)	progressively cap the landfill cells with the approved capping layer, which shall comprise the following (from top to bottom), or an EPA approved alternative:		No areas were available for capping at the time of the site inspection, hence this condition was considered to be not triggered. Procedures for capping are included in the LEMP. Large areas had been temporarily covered for maintenance until required in the future.	Not triggered		No final capping has taken place during the reporting period and since 2013, and therefore this condition has not been triggered. Procedures fo capping are included in the LEMP. Large areas have been temporarily covered for maintenance until required in the future.	Not triggered
		• 0.5 m to 1 m revegetation layer;						
		• geocomposite drainage system with geotextile covers to prevent clogging of the system from sediment migration;						
		• linear Low Density Polyethylene (LLDPE) geomembrane liner to prevent infiltration of water into the landfilled waste;						
		• 0.2 m clay rich bearing layer to form a low permeability and smooth base for geomembrane liner placement;						
		• 0.3 m intermediate cover remaining from the landfill operation;						
		• landfill gas collection trenches underneath the cap, consisting of gravel aggregate and perforated collection pipes connected to an active landfill gas collection system; and						
	(j)	revegetate the covered landfill cells following the capping of each cell and once they reach their final design height	Procedure defined in LEMP Section 6.5.	The process for revegetation of the covered landfill cells following the capping of each cell and once they reach their final design height is defined in LEMP Section 6.5. No areas had been capped at the time of the inspection.	Not triggered		No final capping has taken place during the reporting period and since 2013, and therefore this condition has not been triggered. Procedures fo capping are included in the LEMP.	Not triggered
Cover material	8	The Proponent shall ensure that all daily waste cover material used on site is ENM, VENM and/or alternative daily cover, as approved in writing by the EPA	SOP Acceptance of VENM at Landfill IW - Major Projects - Environment - Fowl~fication Virgin Excavated Natural Material IW - Major Projects - Environment - Fowl~ for the Acceptance and Disposal IW - Major Projects - Environment - Fowl~VENM at WWRRP - Soil Classification	The procedure for acceptance of VENM in landfill defines the process to meet the condition. WCC noted that cover material was sourced from ENM/VENM. SOP for acceptance of ENM/VENM provided. Example of records of waste classification and certification of ENM/VENM where provided as evidence.	Compliant		WCC confirmed that they have received approval from EPA regarding the use of alternative cover materials including VENM, ENM, road asphalt profiling (RAP), steel furnace slag, steel framed fabric and metal covered landfill pits. While not sighted by Cardno, the Independent Auditor confirmed that cover materials used on site are compliant with this condition.	Compliant
Litter control	9	The Proponent shall:	Waste SOP - Wind blown litter collection Whytes Gully Extract from Trim (records management system) Community Service	Fencing was installed around the boundary of the landfill. Cleaning of litter around the perimeter was reported to be conducted by WCC on a campaign basis at least weekly. WCC reported that daily inspections are carried out that includes litter inspections. A template form including the item “workplace free of litter and obstructions” was sighted. During the site inspection significant quantities of litter was observed across the site, generally caught in obstructions such as shrubs, trees and fences and also in and around landfill areas. Off site areas were not accessible to inspect.	**Non-compliant**	LEMP Appendix H	While not sighted by Cardno, the Independent Auditor confirmed that appropriate mitigation measures have been implmenented in accordance with this condition. However, due to significant quantities of litter observed across the site, the site was considered non-compliant with this condition. WCC conducts most of the litter removal at the site via intensive campaigns at least weekly. There is a dedicated crew on site at least once a week performing litter reduction.This non compliance is based on technical wording associated with "clear the site of litter". The auditor has advised that even one piece of litter under this wording renders Council non-compliant.Council does not agree with this interpretation and feels that if the intent was that no single piece of litter should be identified at an time	**Non-compliant**
	(a)	implement suitable measures to prevent the unnecessary proliferation of litter both on and off-site, including the installation and maintenance of a mesh fence of not less than 1.8 metres high around the site; and						

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	(b)	inspect daily and clear the site (and if necessary, surrounding area) of litter on at least a weekly basis.		Minutes of the 2017 Whytes Gully reference group (22 November 2017) indicated that residents advised "that there is a lot of rubbish around, In particular in Reddalls Road, from the corner of the tip to the car yard. One member also mentioned that the area near where he lives there are plastic bags up in the trees." On the basis of site observations during both site inspections, and the feedback from community representatives at the November Whytes Gully reference group, that WCC are not compliant with this condition and that there is significant opportunity to reduce the amount and extent of litter at the site (and off site) through better controls or through more frequent litter reduction campaigns. It is noted that the condition requirement to "clear the site" of litter is very challenging given the extent of plastic bags etc disposed of at the landfill on a daily basis. Recommendation: Increase the effectiveness of litter reduction controls and of litter reduction campaigns to reduce on and off site litter. OFI: Reconsider with DPE what would be acceptable in terms of "clear the site of litter" so as to be able to comply with this condition.			on site, than the consent wording would be that specific. WCC are looking at ways to safely capture of the windblown litter with new designed litter fences and also additional litter reduction staff. WCC will seek an opportunity to discuss calrification of this description.	
Lining system	10	Prior to the commencement of any landfilling over existing landfilled waste, the Proponent must construct a Piggyback Liner System over these surfaces to the satisfaction of the EPA. The Liner System shall include the following (from bottom to top), or an EPA approved alternative:	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015	The CQAP was provided as evidence that the lining system would be constructed as per the requirements of this condition and as per EPA approved design. Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditors as evidence of implementation of the CQAP. These reports included the design and certification of the Piggyback Liner System. The audit team did not conduct any checks of the liner system during inspections and relied Construction Completion Reports as listed to verify compliance with this condition.	Compliant		While not sighted by Cardno, the Independent Auditor sighted documentation and confirmed that the the liner system was in compliance with this condition.	Compliant
	(a)	pipework and gravel trenching to collect and vent landfill gas from the underlying waste to minimise the risk of uncontrolled lateral migration of gas and uplift pressure on the liner;						
	(b)	a foundation or bridging layer at least 500mm thick comprised of clean, well-graded, coarse engineered fill, with geogrid reinforcement at mid-layer, to protect the liner from deformations due to settlement of the underlying waste;						
	(c)	a bearing layer at least 200mm thick comprised of compacted clay to provide a smooth surface for installation of the geosynthetic liner materials;						
	(d)	a composite liner comprised of a reinforced geosynthetic clay liner (GCL) with hydraulic conductivity less than 5 x 10-11 m/s under a 1.5mm thick textured linear low density polyethylene (LLDPE) geomembrane liner;						
	(e)	a geocomposite leachate collection layer, incorporating a tri-planar geonet drainage core between two protection geotextiles, linked to a pipe network graded at a minimum of 2% to convey collected leachate to a sump at the low point in each cell. The geonet must have equivalent hydraulic transmissivity to a gravel collection layer with a saturated hydraulic conductivity of 1 x 10-3 m/s2, taking into account field conditions likely to impair the geonet's ability to convey flow; and						
	(f)	a protection layer comprised of at least 300mm of sand or similar material to protect the geonet and liner from damage (physical and UV).						
	11	The detailed design of the Piggyback Liner System referred to in Condition 10 of this Schedule (above) must include a settlement analysis addressing predicted settlement and lateral deformations of the underlying waste, and demonstrating, to the satisfaction of the EPA, that:	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015	Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence. These reports included the design and certification of Piggyback Liner System settlement analysis. The audit team did not conduct any checks of the liner system during inspections and relied on documents listed to verify compliance with this condition.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the design and certification of the Piggyback Liner System settlement analysis was in compliance with this condition.	Compliant
	(a)	the stresses and strains induced in the geosynthetic liner materials by the predicted settlements will be lower than allowable values, as expressed in contemporary best practice guidelines for design with these types of materials;						
	(b)	there will be no grade reversal of drainage elements which could interfere with collection and conveyance of leachate; and						
	(c)	where these performance requirements cannot be met when modelling the liner system configuration specified in Condition 10 of this Schedule, that augmentations to the thickness and strength of the liner elements in Condition 10 can be made to provide for long term liner integrity under the predicted maximum settlements.						
	12	Prior to the commencement of any landfilling over natural surfaces, the Proponent must construct a Conventional Liner System over the base of the cell to the satisfaction of the EPA. The Liner System shall include the following (from bottom to top), or an EPA approved alternative:	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015	Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence. These reports included the design and certification of Cell based Liner System. Detailed design report was provided as evidence of compliance and as per EPA approved design. The audit team did not conduct any checks of the liner system during inspections and relied on documents listed to verify compliance with this condition.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the design and certification of the cell based liner system was in compliance with this condition.	Compliant
	(a)	a bearing layer at least 200mm thick of compacted clay to provide a smooth surface for installation of the geosynthetic liner materials;						
	(b)	a composite liner comprised of a reinforced geosynthetic clay liner (GCL) with hydraulic conductivity less than 5 x 10-11 m/s under a 2mm textured high density polyethylene (HDPE) geomembrane liner. A cushion geotextile must be installed above the geomembrane to protect it from construction and waste-related load damage, including excessive strains introduced by indentation from the overlying gravel drainage aggregate;						
	(c)	for leachate collection in areas other than over natural ridge areas, a gravel leachate collection layer at least 300mm thick containing a pipe network graded at a minimum of 2% to convey collected leachate to a sump at the low point in each cell. The gravel must be 20mm nominal size gravel with a saturated hydraulic conductivity of greater than 1 x 10-3 m/s2. The particle size distribution must be uniform, with maximum particle size 26.5mm, not more than 20% passing the 19mm standard sieve aperture, not more than 10% passing the 13.2mm standard sieve aperture, and not more than 3% smaller than 0.075mm. A filter protection geotextile must be placed above the gravel; and						
	(d)	for leachate collection over natural ridge areas, a geocomposite leachate collection layer and a protection layer, as per the requirements for these elements specified for the Piggyback Liner System in Condition 10 of this Schedule.						

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	13	The Proponent shall prepare and implement a **Construction Quality Assurance Plan** for the project. The plan must:	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015 WHYTES GULLY NEW LANDFILL CELL Construction Quality Assurance Plan (CQAP) Package 2 and 3 Landfill Cells, 20 December 2016	The Construction Quality Assurance Plan for Package 2 and 3 Landfill Cells, as listed was provided by WCC. Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence. These reports included the certification that the QAQC Plans have been implemented during construction (Section 1.1 of each completion report).	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the Construction Quality Assurance Plan for the project was in compliance with this condition.	Compliant
	(a)	be prepared in consultation with EPA by a suitably qualified and experienced expert whose appointment has been endorsed by the Director-General;						
	(b)	be approved by the Director-General prior the commencement of construction, or at a time otherwise approved by the Director-General;						
	(c)	outline the construction activities and staging;						
	(d)	outline the measures taken (e.g. by independent testing, certification, monitoring and inspection) to ensure that the construction and installation of the final leachate-barrier management and collection system would be successful and quality assured;						
	(e)	specify the final leachate-barrier material selection and construction techniques;						
	(f)	specify/validate of the final thickness and permeability of leachate barrier/s; and						
	(g)	include an environmental-awareness site-induction program for construction personnel.						
		This plan must be documented in the CEMP (see Condition 2 in Schedule 5).						
Soil and water								
Surface water discharge limits	14	The Proponent shall ensure that all licensed surface water discharges from the site comply with the discharge limits (volume and quality) set for the project in any EPL or relevant provisions of the POEO Act.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	As noted in the annual report 2016-2017, surface water that exited the site in June 2016 and July 2016 contained suspended solids at levels above the 50mg/L concentration limit prescribed in the sites Environment Protection Licence. Downstream samples taken at the same time indicated suspended solids <50mg/L concentration limit and it was reported by WCC that there was no material harm caused by the non-compliance (as defined by Section 147 of the POEO Act 1997). To help reduce the likelihood of future non-compliances, a Wet Weather and Stormwater Management work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. Since the implementation of the new work instruction, no further sediment rich discharges have occurred. Council consider that these are historic results and that Council has implemented amended controls to eliminate recurrence, noting that controls implemented are performing as designed. Though the above situation has been reported by WCC through the EPL Annual Report for 2016-2017, the exceedance of suspended solids above the discharge limit is noted as non-compliant to this condition. Recommendation: Continue to review the effectiveness of corrective actions applied to site water management and address any further non compliances as required.	**Non-compliant**	EPL Annual Report 2017/2018	The non compliance noted by the Independent Auditor has been reported to the EPA and additional processes and procedures have been placed around the sites storm water management and reviewed after each event. This non-compliance is a replication of a historic EPL non compliance and has since been managed to the satisfaction of the EPA. The Annual Report 2017/2018 addresses the conditions for surface water discharges from the site as licenced under EPL 5862 by the EPA. Under Section 3 (L1.2) of the EPL 5862 there is to be no discharge of contaminated stormwater to waters under dry weather conditions(less than 10mm of rainfall within a 24 hr period) or a storm event/s of less than 1:10 year, 24 hour recurrence interval (less than 297.4 mm of rainfall within a 24 hour time period). In addition, under Section 3 (L2) of EPL 5862, stormwater monitoring at Reddalls Road (Monitoring Point 1) is required to have a pH range of 6.5 to 8.5, and Total Suspended Solids (TSS) less than 50 mg/L. During the 2017/2018 monitoring period (29 May 2017 to 28 May 2018), contolled releases of uncontaminated stormwater occurred on ten occassions with standing water level, turbidity and pH measured and validated prior to each release. Prior to each release, pH measured between 6.4 to 8.5, and TSS was below 50 mg/L. However, during the annual monitoring event at Monitoring Point 1, a pH of 9.7 was measured, which was outside the acceptable range of EPL 5862. The elevated pH at Point 1 correlated with high concentrations of alkalinity (carbonate as calcium carbonate), chloide, sodium and sulfate. In addition, Monitoring Point 33 recorded elevated concentrations of ammonia during the annual monitoring event. It was noted that Monitoring Point 1 and Monitoring Point 33 were stagnant at the time of sampling and that releases of stormwater and leachate did not occur during the reporting period. Contaminant detections at Monitoring Point 1 and Monitoring Point 33 could be the result of interference from runoff originating at Reddalls Road as opposed to the site. It was recommended in the 2017/2018 Annual Report that Monitoring Point 1 be relocated upstream to a point between Reddalls Road and the site boundary to eliminate the risk of cross contamination. In addition, the results from these two monitoring points should be monitored closely during future monitoring events to confirm if the unusual results were anomalous or indicative of potential leachate interaction with stormwater bodies.	Compliant
	15	The Proponent shall:	WHYTES GULLY LANDFILL Detailed Design Report Update - Tender Package 2 and 3 Landfill Cells, 5 October 2016 Whytes Gully Stormwater Management Work Instruction July 2016					
	(a)	design and install the stormwater management and collection system (including new stormwater pond and drainage) generally in accordance Chapter E14 of the Wollongong DCP 2009;		Section 7 of Detailed Design Report defined the surface water management and collection design. To enable the construction of Tender Packages 2 and 3, several additional surface water drains have been designed to manage the diversion of water from the central ridge diversion drain and cascade (constructed with Tender Package 1) and to divert stormwater along the perimeter bund of the Package 2 Piggyback Liner. As per EPL O6.11 The licensee is permitted to construct the Package 2 and Package 3 Landfill Cells in accordance with the following documents, drawings and requirements: a) "Preliminary Design Report", Golder Associates, April 2012; b) "Whytes Gully Resource Recovery Park - Detailed Design Report Tender Packages 1, 2 and 3", Golder Associates, June 2013; and c) "Whytes Gully Landfill Detailed Design Report Update - Tender Package 2 and 3 Landfill Cells", Golder Associates, October 2016. The most recent document, drawing and requirement supersedes any conflict between older documentation, drawings and requirements. Auditors have not assessed if the stormwater management system was constructed in accordance with Chapter E14 of the Wollongong DCP 2009. Based on the above discussion WCC is considered	Compliant		While this information was not sighted by Cardno, the Independent Auditor confirmed that the surface water management and collection design was compliant with this condition.	Compliant
	(b)	ensure that the system capacity has been designed in accordance with the Blue Book Volumes 1 and 2B and Chapter E14 of Wollongong DCP 2009;		Erosion and sediment control plans for the construction work of Packages 2 and 3 were provided as evidence to this requirement. Auditors have not verified the report as compliant with the condition relating to the Blue Book, and have relied on the EPA's approval for the consideration of compliance.			While this information was not sighted by Cardno, the Independent Auditor confirmed that the EPA's approval of the design ensured compliance with this condition.	Compliant
	(c)	ensure peak stormwater discharge rates from the site at each stage of the project do not exceed pre-development values;		This was not able to be fully verified during this audit. However based on the site surveillance reports provided and site operations manager there was no reported recent overflow of the sediment pond. A Wet Weather Monitoring and Stormwater Management work instruction was provided. Implementation of this was validated through the site inspection records.			While not sighted by Cardno, the Independent Auditor confirmed that site surveillance reports did not report any overflow of the sediment pond.	Compliant
	(d)	divert existing clean surface water around operational areas of the site;		Various clean water diversion drains were observed. A Rain flap was also installed to reduce stormwater entering the landfill area.			While not sighted by Cardno, the Independent Auditor confirmed that there was evidence of compliance with this condition.	Compliant
	(e)	direct all sediment laden water in overland flow away from the leachate management system; and		Surface water or stormwater is directed to the sediment pond which is separate to the Leachate management system.			While not sighted by Cardno, the Independent Auditor confirmed that there was evidence of compliance with this condition.	Compliant
	(f)	prevent cross-contamination of clean and sediment or leachate laden water,		There were no reported cross contamination or leaks of leachate water into the surface water. No evidence of cross contamination of clean water by leachate water was noted during site inspections.			While not confirmed by Cardno, the Independent Auditor did not observe any evidence or reports of cross contamination of clean and sediment or leachate laden water.	Compliant
	(g)	to the satisfaction of the Director-General.		WCC did not provide evidence of "satisfaction of the Director General" as required of this condition. OFI: It is suggested WCC consult with DPE so as to define what is required to obtain or demonstrate "satisfaction of the Director General" for surface water management.	**OFI**		WCC did not provide evidence of "satisfaction of the Director General" as required of this condition. OFI: It is suggested WCC consult with DPE so as to define what is required to obtain or demonstrate "satisfaction of the Director General" for surface water management.	**OFI**
Flooding management	16	The Proponent must prepare and implement a **Flood Emergency and Evacuation Plan** to the satisfaction of the Director-General. The Plan must:	117625003_287_R_Rev1 Flood Emergency Evacuation Plan	Flood emergency evacuation plan was prepared by Golder Associate and was submitted to DPE for approval In August 2013. This was approved by DPE as part of the LEMP approval letter dated 11/12/14.	Compliant	LEMP Appendix N Flood Emergency and Evacuation Plan	A Flood emergency and Evacuation Plan was prepared by Golder Associates and was submitted to DPE for approval in August 2013. This plan was approved by DPE as part of the LEMP approval letter dated 11/12/14. This plan is document in LEMP Appendix N.	Compliant
	(a)	be prepared by a suitably qualified and experienced expert in consultation with Council;						

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	(b)	be approved by the Director-General prior to the commencement of construction;	LEMP Appendix N	Emergency Exercise was conducted at – Wollongong Waste and Resource Recovery Park Date 25/1/2017 Time 10.00am No flooding event that has been reported to date at the site, hence full implementation of the plan has not been tested. This plan is documented in LEMP Appendix N.			Section 2 of the Plan outlines that the proposed reconfiguration of the leachate ponds in Lot 50 DP 1022266 lies above the Flood Plain Level and will therefore not be affected by flood level or flood behaviour. The proposed footpint of the surface water treatment ponds lie within the FPA, however existing floodplain storage would be maintained at the location. Therefore, the Proposal would not affect flood levels or flood behaviour. No mitigation measures were therefore proposed. Contingency measures proposed in the event of a major flood event are outlined in Section 2.4 of the Plan. Section 3 and Appendix A of the Plan includes the Wollongong City Council Emergency Reponse procedures and Plans & Pollution Incident Response Plan for the site. This includes procedures for evacuation, for flooding of entry and exit roads at the site, and for management of escaped leachate from the site. While evidence was not sighted by Cardno, the Independent Auditor confirmed that an emergency exercise was conducted at the site on 25 January 2017, and no flooding events have been reported to date at the site.	
	(c)	ensure the project is designed in accordance with Chapter E13 of Wollongong DCP 2009, Council's Mullet and Brooks Creeks Floodplain Risk Management Study and Plan and the NSW Floodplain Development Manual, taking into account Council's conduit blockage criteria;						
	(d)	identify contingency actions to be implemented in the event that the site is inundated during a major flood event to protect:						
		• the integrity of stormwater/leachate ponds and prevent release of stormwater/leachate into the local environment including water quality control measures; and						
		• human safety.						
	(e)	identify emergency evacuation routes, flood warning alarms, and evacuation procedures.						
		This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).						
Leachate management	17	The Proponent shall:	Western Gully Deep Leachate Drainage Completion Report, 17 August 2017 Section 7.0 LEMP		Compliant	LEMP Section 7 LEMP Appendix E - Whytes Gully Landfill Surface Water and Leachate Management Plan & Whytes Gully Landfill Leachate Management Study		Compliant
	(a)	design and install the leachate management and collection system (including new leachate pond) generally in accordance with the conceptual design in the EA/PPR, applicable Australian Standards and industry standard best practice guidelines, or otherwise approved by the EPA;		Construction of the Leachate Drainage System was approved by NSW EPA through Environment Protection Licence (EPL) 5862 Condition O6.13: The licensee is permitted to construct the Deep Leachate Drainage System in accordance with the following documents, drawings and requirements: a) "Henry & Hymas Detailed Design Report - Project Name: Western Gully Deep Leachate Drainage System - Whytes Gully Landfill", H&H Consulting Engineers Pty Ltd, December 2016. The leachate system was observed under construction during the site inspections, including a new leachate pond. The Western Gully Deep Leachate Drainage Completion Report, 17 August 2017 covered this aspect of the leachate management system.		Whilst not sighted by Cardno, the Independent Auditor confirmed that the Western Gully Deep Leachate Drainage System was designed and installed in compliance with this condition.	
	(b)	ensure that leachate generated by the project is minimised and appropriately contained, collected and disposed of;		The management of leachate is detailed in the LEMP, Section 7. An incident involving a broken leachate line incident was reported to the EPA on 20 November 2017. As reported by the Waste Operations Manager, the leachate was contained and collected. The incident report was not available at the time of this audit.			The management of leachate is detailed in the LEMP Section 7. Management features (stormwater diversion, leachate ponds, leachate treatment plant) are in place to enable the appropriate management of leachate. As noted by the Independent Auditor, an incident involving a broken leachate line was reported to the EPA on 20 November 2017. The incident was reported by the Waste Operations Manager, who noted that the leachate was contained and collected.	
	(c)	collect and store all leachate generated by the project until it is transferred for treatment/processing;		Defined under LEMP Section 7. During the site inspection, leachate was observed being stored prior to treatment.			The management of leachate is detailed in the LEMP Section 7. While not sighted by Cardno, the Independent Auditor confirmed that during the site inspection, management of leachate was compliant with this condition.	
	(d)	install a leachate barrier to be used for the direct impoundment of leachate (see Conditions 10 to 13 of this Schedule);		Defined under LEMP Section 7. See responses to conditions 10-13.			The management of leachate is detailed in the LEMP Section 7. Refer to responses to conditions 10-13.	
	(e)	design and operate the leachate management system to prevent leachate from escaping to surface water, groundwater or the surrounding subsoils;		Defined in Western Gully Deep Leachate Drainage Completion Report, 17 August 2017.			While not sighted by Cardno, the Independent Auditor reported that the Western Gully Deep Leachate Drainage Completion Report (17 August 2017) confirmed compliance with this condition.	
	(f)	ensure that the leachate management and collection system does not include leachate discharge or disposal by way of leachate re-injection into any active or capped landfill cell, unless otherwise approved by the EPA;		Defined under LEMP Section 7. As detailed above, the design has been approved by the EPA.			The management of leachate is detailed in the LEMP Section 7. WCC confirmed that reinjection does not take place at the site. While not sighted by Cardno, the Independent Auditor confirmed that during the design was in compliance with this condition.	
	(g)	direct all surface water from areas not subject to waste disposal or leachate disposal away from the leachate management system; and		Defined under LEMP Section 7. Observations during the site inspection indicated that surface waters are generally away from the leachate management system, where feasible.			The management of leachate is detailed in the LEMP Section 7. While not sighted by Cardno, the Independent Auditor confirmed that during the site inspection, management of leachate was compliant with this condition.	
	(h)	treat all water that has entered areas filled with waste, or been contaminated by leachate, as leachate,		Defined under LEMP Section 7. Water that had entered the waste placement areas was generally managed as leachate and directed to the leachate treatment plant.			The management of leachate is detailed in the LEMP Section 7. While not sighted by Cardno, the Independent Auditor confirmed that during the site inspection, management of leachate was compliant with this condition.	
		to the satisfaction of the Director-General.		WCC could not demonstrate "satisfaction of the Director General through documents. Auditors have not completed detailed assessment of the Leachate Management System and have relied on the documents listed to determine compliance with this condition.			The Independent Auditor noted that compliance with this condition was based on the documents listed rather than a detailed assessment of the Leachate Management System.	
~~Soil, water and leachate management plan~~	18	~~The Proponent shall prepare and implement a Soil, Water and Leachate Management Plan for the project in consultation with Council, NOW and the EPA and to the satisfaction of the Director-General. This plan must be prepared and implemented by a suitably qualified and experienced person and be approved by the Director-General prior to the commencement of operation. The plan must include:~~		(Omitted due to Modification 2)			(Omitted due to Modification 2, discussed in Modification 2 table)	
	~~(a)~~	~~a site water balance that:~~						
		~~• identifies the source of all water collected or stored on site, including rainfall, stormwater and groundwater;~~						
		~~• includes details of all water use on site and any discharges; and~~						
		~~• describes the measures that will be implemented to minimise water use on site.~~						
	~~(b)~~	~~an erosion and sediment control plan that:~~						
		~~• is consistent with the requirements in the latest version of the Blue Book Volume 1 and Volume 2B;~~						
		~~• identifies the activities on site that could cause soil erosion and generate sediment; and~~						
		~~• describes the measures that will be implemented to:~~						
		~~○ minimise soil erosion and the transport of sediment to downstream waters, including the location, function and capacity of any erosion and sediment control structures and maintain these structures over time;~~						
		~~○ ensure that any topsoil stockpiles on site are suitably managed to ensure that the topsoil in these stockpiles can be beneficially used in the proposed revegetation and rehabilitation of the site.~~						
	~~(c)~~	~~a leachate management plan that:~~						
		~~• includes final detailed design specifications of the leachate management and collection system on site;~~						
		~~• demonstrates how the requirements of Condition 17 of this Schedule have been addressed; and~~						
		~~• includes a remedial action plan should leachate escape the leachate containment system.~~						
	~~(d)~~	~~a stormwater management plan that:~~						
		~~• is consistent with the guidance in the latest version of the Blue Book Volume 1 and Volume 2B and Chapter E14 of Wollongong DCP 2009;~~						
		~~• includes final detailed design specifications for the stormwater management and collection system; and~~						
		~~• demonstrates how the requirements of Condition 15 of this Schedule has been addressed;~~						
	~~(e)~~	~~an on-going surface water, groundwater and leachate monitoring program that includes (but is not limited to):~~						
		~~• baseline data;~~						
		~~• a combined surface and groundwater monitoring program to gain an understanding of surface and groundwater interaction and the potential for any impacts of the project on the downstream environment including GDEs and Dapto Creek;~~						
		~~• surface and groundwater impact assessment criteria including trigger levels for investigating adverse impacts;~~						
		~~• a Mitigation Plan detailing the remedial actions to be implemented address potential impacts on the downstream environment from surface or groundwater contamination associated with the project and/or in the event of exceedances of the surface and/or groundwater impact assessment criteria; and~~						
		~~• a commitment to provide the results of monitoring to NOW and other relevant government agencies every 12 months.~~						
		~~This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).~~						
Contamination management plan	19	The Proponent shall prepare and implement a **Contamination Management Plan** for the project to the satisfaction of the Director-General. This Plan must:	Construction Environmental Management Plan Framework Section 3.7 Contamination Management Plan	The CEMP was prepared by Golder associates and was submitted to DPE and approved on 20/8/2013. The CEMP addresses the requirements for the Contamination Management Plan. WCC reported that many aspects of the implementation of the Contamination management plan had not been triggered as no known contamination was uncovered or reported to date.	Compliant	Construction Environmental Management Plan Framework Section 3.7 Contamination Management Plan	The CEMPF was prepared by Golder Associates and was submitted to DPE and approved on 20 August 2013. The CEMPF includes a Contamination Management Plan in Section 3.7. WCC reported that many aspects of the implementation of the Contamination Management Plan had not been triggered as no known contamination was uncovered or reported to date.	Compliant
	(a)	be prepared by a suitably qualified and experienced expert;						
	(b)	be submitted to the Director-General prior to the commencement of construction;						
	(c)	detail the protocols to be put in place and followed in the event that contaminated soil (including Acid Sulfate Soils) or water is encountered during construction;						
	(d)	be prepared in accordance with the relevant best practice industry guidelines such as the NSW State Government's Acid Sulfate Soils Manual (ASSMAC 1998);						

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	(e)	detail how excavated soil will be tested, handled and stockpiled;						
	(f)	detail the measures that will be employed to prevent erosion and sedimentation of contaminated soil; and						
	(g)	outline how contaminated soil and water will be disposed of off-site (e.g. at a licensed facility).						
		This plan must be documented in the CEMP (see Condition 2 in Schedule 5).						
Bunding	20	The Proponent shall store all chemicals, fuels and oils used on-site in appropriately bunded areas in accordance with the requirements of all relevant Australian Standards, and/or EPA's Storing and Handling Liquids: Environmental Protection – Participants Handbook.	Site inspection Work Health and Safety - Site Specific OHS Procedures - Substance Register Whytes Gully CURRENT 2015	A Substance Register was provided as evidence for registering chemicals used onsite and brought to site by subcontractors. Based on a brief site inspection WCC storage and handling of chemicals were in general accordance with this requirement. The generator for the wastewater treatment plant was bunded as per the photo below. Chemicals for the wastewater treatment plant were also stored in bunded area.	Compliant		While not sighted by Cardno, the Independent Auditor reviewed documentation and the site and confirmed that the site is compliant with this condition.	Compliant
Erosion and Sediment Control	21	During the construction of the project, the Proponent shall implement suitable erosion and sediment control measures on site, in accordance with the relevant requirements in the latest version of the Managing Urban Stormwater: Soils and Construction guideline.	Section 3.3 of CEMP defined the erosion and sedimentation controls ESCP Rev1 for Stage 2 Construction Of A New Landfill Cell At Wollongong Waste And Resource Recovery Park	A separate sediment basin/sump was constructed within the construction area and sand bags were noted along the access. Erosion and sediment control plans were developed and implemented at the site. Surveillance Reports with issues on erosion and sedimentation controls were also provided as evidence of implementation and maintenance. Issues related to erosion and sediment control are provided in response to Condition 18(b) above.	Compliant Refer to Condition 18(b).	Construction Environmental Management Plan Framework Section 3.3	Suitable erosion and sediment control measures are outlined in Section 3.3 of the CEMPF. While not sighted by Cardno, the Independent Auditor confirmed that construction at the site was compliant with this condition.	Compliant
Soil	22	The Proponent shall:	Site inspection	It was noted during the site inspection that a large part of the construction area is flat and sediments are contained within the construction footprint. A sump was installed within the construction area to collect sediments and run-off is contained within construction footprint. WCC reported that top soil was segregated and stockpile onsite for re-use. No records of the storage of topsoil were sighted.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that the site was compliant with this condition.	Compliant
	(a)	minimise any soil loss through erosion on site;						
	(b)	set aside any topsoil won on site for the proposed revegetation and rehabilitation of the site; and						
	(c)	ensure that any topsoil stockpiles on site are suitably managed to ensure that the topsoil in these stockpiles can be beneficially used in the proposed revegetation and rehabilitation of the site.						
Air quality								
Odour	23	The Proponent shall ensure the project does not cause or permit the emission of any offensive odour (as defined by the POEO Act).	Site Inspection 19. SOP - Deodouriser Trailer Operator Manual - Whytes Gully	No offensive odour was noted at the time of the first site inspection during calm, and sunny conditions. A deodoriser was observed to be in operation during the first site visit. However, during the second site visit, some odour was observed up slope of the tipping face on the high point of the landfill, which was downwind at the time of the inspection. The odouriser was not in operation during the second site visit. There did not appear to be a process for specific management of the face during these more adverse wind conditions. Minutes of the Whytes Gully Reference Group meeting on 24 May 2017 indicated that one member "mentioned the smell in the morning when the lids are lifted. It was advised that the deodoriser trailer is turned on prior to site start up to minimise odour generated. Another member mentioned that sometimes the smell is as late as 10:00am." No mention of odour was made in the Minutes of the Whytes Gully Reference Group meeting on 22 November 2017. Selected incident reports were provided by WCC for odour complaints on 24 November 2016 (1 complaint); 6 March 2017 (4 complaints); and 17 March 2017 (4 complaints). The reports showed that complaints are followed up with weather data and other factors documented. The EPA issued a letter to WCC dated 30 March 2017 responding to a letter from WCC dated 21 March 2017 in relation to odour complaints made in March 2017. The EPA noted that the identified the cause of the complaints relates to a premises not under the control of WCC. Given the audit site inspections were of limited duration, it was not possible to fully assess compliance with this condition and is considered Not Verified. Recommendation: WCC to ensure that odouriser is in operation as required to minimise the risk of offensive odour going off site. It is recommended that WCC review the implementation of the procedure regarding the use and placement of the odouriser. Recommendation: It is recommended that WCC conduct additional odour monitoring to re-assess the potential for odours during southerly winds and assess if existing controls are adequate to prevent off site odours. Based on the outcomes of the monitoring, additional controls may be warranted.	**Not Verified**		Complaints regarding odour, if/when received, are investigated by WCC and reported to the EPA. Adequate mitigation measures are implementented at the site. The Independent Auditor confirmed that a deodoriser was in operation during their first site visit, however was not in operation during their second site visit when odour was observed. A process of specific management of the face was not evident during these more adverse wind conditions. While not sighted by Cardno, the Independent Auditor observed incident reports completed which showed that complaints are followed up with water data and other factors are documented. The Independent Auditor also noted a letter from EPA dated 30 March 2017, which noted that the cause of the complaints noted by WCC on 21 March 2017 related to a premises not under the control of WCC. It was recommended by the Independent Auditor that WCC ensure that the odouriser is in operation as required to minimise the risk of offensive odour going off site, and review the use and placement of the odouriser. In addition, it was recommended that WCC conduct additional odour monitoring to reassess the potential for odours during southerly winds and assess if existing controls are adequate to prevent off site odours. Based on the outcomes of the monitoring, additional controls may be warranted. WCC confirmed that odour monitoring is conducted daily and upon the opening of the site as well as regular use of an odour abatement system (deoderisor). WCC will undertake an additional odour monitoring trial, specifically southerly winds to see if there are any extra odours generated. This will be reported in the next report.	**Not verified**
Dust criteria	24	The Proponent shall ensure that dust generated by the project does not exceed the criteria listed in Tables 2 to 4 at any private residential receiver, or on more than 25 percent of any privately owned land surrounding the site.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data	Dust monitoring results were presented in a register. Data for the old and new dust monitoring locations were included in the register. Monthly monitoring was conducted and results as reported by WCC were within the required criteria.	Compliant		Five new dust deposition gauges (DDG1 to DDG5) have been installed around the site. Dust is currently monitored at on-site locations, and there have been no reported complaints regarding dust from off-site locationes to date. Monitoring results are posted on the WCC website, and dust data for the current monitoring period were generally within the required criteria.	Compliant
Dust minimisation	25	During construction, the Proponent shall ensure that:	Site Inspection Daily Inspection Tip face	Water cart was in operation to control dust.	Compliant			Compliant
	(a)	all vehicles on site do not exceed a speed limit of 25 kilometres per hour;		Speed limit at site was imposed, and speed limit signs were observed to be posted around the site			WCC confirmed that speed limit signs of 15 kph are installed at the site, and WCC staff pull over drivers who are travelling in excess of the speed limit. While not sighted by Cardno, the Independent Auditor noted that the speed limit was observed around the site.	
	(b)	all loaded vehicles entering or leaving the site have their loads covered; and		During the site inspection it was observed that loaded vehicles entering or leaving site have their loads covered. Covers were only open at the weighbridge for spot check on content of the vehicle.			WCC confirmed that signage is provided on Reddalls Road that states all loads mut be covered. While not sighted by Cardno, the Independent Auditor noted that all loads were covered when entering or leaving the site, with the exception of during spot checks at the weighbridge.	
	(c)	all loaded vehicles leaving the site are cleaned of dirt, sand and other materials before they leave the site, to avoid tracking these materials on public roads.		No tracking of dirt or dust was noted on the road during the site inspection. A daily inspection of roads is also conducted by WCC. The inspection form included dust monitoring and control. No complaints had been received regarding dust tracking.			WCC conduct a daily inspection of the site, which includes inspection for dirt or dust tracking. While not sighted by Cardno, the Independent Auditor noted that no tracking of dirt or dust was noted on the road during the site inspection, and no complaints had been received regarding dust tracking.	
Operating conditions	26	The Proponent shall:	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data SOP Placement & Compaction of waste SOP - Deodouriser Trailer Operator Manual - Whytes Gully Daily inspection Tip Face completed forms Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017		**Compliant OFI-Refer to Sch 4 (23)**	LEMP Appendix H Standard Operating Procedures		**Compliant with OFI Schedule 4 Condition 23**
	(a)	implement best management practice, including all reasonable and feasible dust and odour mitigation measures to prevent and minimise dust and odour emissions from operation;		WCC have developed a number of SOPs aimed at reducing dust and odour emissions. General implementation of these was evident during site inspections. There was no visible dust observed during the site inspections and a water cart was onsite for dust suppression. There is a long bitumen road on site which reduces the amount of mud and dirt picked up by trucks entering the site and trucks would likely lose dirt from wheels prior to leaving the site. At the time of the first site inspection the nature of the filling process led to a small area available for tipping, hence the design of the landfill led to a reduced tipping area. For the second site visit, the tipping area was slightly larger. WCC reported that the size of the tipping face is managed to be minimal for the reduction of odours and litter. An Odouriser was also installed and in operation to minimise odour for the first site visit. There was no offensive odour noted during the first site inspection. However, during the second site visit the odouriser was not in used and with strong southerly winds some odour was noted on higher		Appendix H of the LEMP outlines the Standard Operating Procedures for use at the site. WCC confirmed that a water cart and deodoriser are used at the site, and all waste is covered daily and immediately following placement. While not sighted by Cardno, the Independent Auditor confirmed that management practices were in operation at the site, however the OFI from Schedule 4 Condition 23 should be observed.	
	(b)	prevent and minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events;		It was evident that WCC focus on having a very small tip face open which reduces the potential for odour generation. On the second site inspection, southerly winds were evident leading to a higher risk of off site odours. There did not appear to be a process for specific management of the face during these more adverse wind conditions. Refer to discussion and OFIs for Condition 23.			WCC confirmed that the implementation of management measures are used more frequently during adverse meteorological conditions and extraordinary events. However, the Independent Auditor noted that there did not appear to be a process for specific management of the face during more adverse weather conditions and the OFI from Schedule 4 Condition 23 should be observed.	
	(c)	regularly assess air quality monitoring data and relocate, modify, and/or stop operation to ensure compliance with the relevant conditions of this consent; and		There are 3 old dust gauges (C328-1, C328-2 and C328-3) and 5 new dust gauges (DDG1 to DDG5) installed around the site. Monitoring results are posted in WCC website The dust monitoring data were analysed and graphed. The data is reported in the MONITORING LANDFILL SITES MASTER Whytes Gully analytical data. No reported exceedance of the criteria was observed in this data as presented. It was noted there was no observed increase of dust deposited during construction based on the data provided.			Five new dust deposition gauges (DDG1 to DDG5) have been installed around the site. Dust is currently monitored at on-site locations, and there have been no reported complaints regarding dust from off-site locationes to date. Monitoring results are posted on the WCC website, and dust data for the current monitoring period were within the required criteria.	
	(d)	minimise surface disturbance of the site, other than as permitted under this consent.		Disturbed areas were generally observed to be areas required for landfilling or the construction of new areas of the landfill. Exposed ground and stockpiles are spray grassed to stabilise surfaces.			While not sighted by Cardno, the Independent Auditor confirmed that the operation of the site was in compliance with this condition.	

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Project Areas	27	For each stage of the project identified in Table 5 (below), the Proponent shall comply with the maximum area specified for active tipping face, waste relocation, daily cover and 90 day cover in the corresponding row and columns (from left to right), unless otherwise approved by the Director-General in consultation with the EPA.	Section 3.0 of LEMP EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017	Section 3.0 of LEMP defined the future operations and key site features that covers this requirement. WCC provided an example of - Daily inspection Tip Face and waste data tonnage, SOP for placement and compaction of waste and volumetric survey (EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017). Implementation: At the time of the site inspection there was no relocation of wastes, hence the areas defined in Table 5 for this purpose were being complied with. Based on the site inspection, it was not able to be determined what the exact area of the active tipping face was and whether this was within the limits of Table 5. WCC were not able to provide figures demonstrating the exact size of the tip face; daily cover and 90 day cover areas so as to demonstrate compliance with the condition. Based on the apparent and relatively small size of the tipping face, WCC were deemed compliant with this condition for the tipping face. The areas of the daily cover and 90 day cover were not provided by WCC and compliance with this aspect of the condition was not able to be verified. OFI: It is recommended that WCC conduct a review of implementation of the LEMP and SOPs in respect to tipping areas to demonstrate compliance with the figures in Table 5 for the areas of tipping face; daily cover; and 90 day cover.	**Compliant** **OFI**	LEMP Section 3.0	Section 3.0 of LEMP defined the future operations and key site features that covers this requirement. The Independent Auditor assumed that based on the apparent and relatively small size of the tipping face, WCC were deemed compliant with this condition. However, the Independent Auditor was not able to confirm if this was the case and recommended that WCC conduct a review of implementation of the LEMP and SOPs to confirm compliance with this condition.	**Compliant** **OFI**
Monitoring	28	The Proponent shall install and operate a meteorological weather monitoring station on the site for the life of the project that complies with the requirements in the latest version of the EPA's Approved Methods for Sampling of Air Pollutants in New South Wales guideline. The meteorological station must be maintained so as to be capable of continuously monitoring the following parameters: air temperature, wind direction, wind speed, rainfall and relative humidity.	Section 2.3.3 of LEMP defined the Climate Data collection.	A Davis Vantage Pro 2 meteorological station has been installed at the site that will measure air temperature, wind direction, wind speed, rainfall and relative humidity. Data is being recorded and meets the requirements of the condition.	Compliant	LEMP Section 2.3.3	WCC confirmed that a meteorological station (Davis Vantage Pro 2) has been set up at the site and is maintained routinely. While not sighted by Cardno, the Independent Auditor confirmed that data is being recorded by the station and meets the requirements of this condition.	Compliant
Air quality management plan	29	The Proponent shall prepare and implement an **Air Quality Management Plan** for landfilling operations in consultation with the EPA. The plan must:	Section 8 of LEMP defined the Air Quality Management for landfill gas and Section 9.6 for odour MONITORING LANDFILL SITES MASTER Whytes Gully analytical data		Compliant	LEMP Section 8 defines the AQMP, and Section 9.6 outlines management of odour.	The Air Quality Management Plan (AQMP) is included in the LEMP which was prepared by Golder Associates. The AQMP, as part of the LEMP, was approved by DPE on 11 December 2014. This condition is addressed under sections 8.0 for Landfill Gas and 9.6 for odour.	Compliant
	(a)	be prepared and implemented by a suitably qualified and experienced expert;		The AQMP is included in LEMP which was prepared by Golders.				
	(b)	be approved by the Director-General prior to the commencement of operation;		The AQMP was approved with the LEMP by DPE on 11/12/14.				
	(c)	describe the measures that will be implemented to ensure:		WCC adopts a strategy for day to day management of landfill via a combination of the leachate barrier system and covering of wastes, use of odouriser and dust suppression. Management of odours has been discussed under Condition 23 and 26. See relevant findings and OFI for these conditions.			WCC adopts a strategy for day to day management of landfill via a combination of the leachate barrier system and covering of wastes, use of odouriser and dust suppression. Management of odours has been discussed under Condition 23 and 26. See relevant findings and OFI for these conditions.	
		• best management practice is employed;						
		• the air quality impacts (including odour) from landfilling are minimised during adverse meteorological conditions and extraordinary events; and						
		• compliance with the relevant conditions of this approval.						
	(d)	describes the air quality management system; and		There is no specific conditions relating to landfill gas containment in the license. The Landfill Guidelines recommend that landfill gas should be contained by a combination of leachate barrier system, site capping and revegetation and covering of waste. The photo shown below is one of gas manifolds or gas well. Flaring was also observed during the site inspection. Section 8.3 of LEMP defined the gas monitoring requirements. The following management techniques are applied: - subsurface gas monitoring wells - subsurface gas monitoring program - surface gas emission monitoring and - gas accumulation monitoring. Results of monitoring are presented in register included in Monitoring Landfill Sites Master Whytes Gully analytical data			Section 8.2.2 describes the current and future management strategy for landfill gas extraction/disposal, while Section 8.3.1 describes the management strategies for subsurface and surface gas monitoring, as well as gas accumulation monitoring. The following management techniques are applied: - subsurface gas monitoring wells - subsurface gas monitoring program - surface gas emission monitoring and - gas accumulation monitoring. While not observed by Cardno, the Independent Auditor confirmed that flaring was observed during their site inspection. The Independent Auditor also reviewed results of monitoring to confirm that the monitoring outlined in Section 8.3 of the LEMP were being implemented.	
	(e)	includes an air quality monitoring program that:		The air quality monitoring as defined in LEMP Section 8 AQMP, included the following: - Odour observation - Landfill gas monitoring - Dust observation Based on the site inspection on 27 November 2017, the auditor recommends that WCC evaluate and report the effectiveness of the air quality management system specifically odour. See the OFIs under Condition 23 and 26.			Sections 8.3.1, 8.3.2 and 8.3.3 outline the manage strategies in place at the site, which includes odour observation, landfill gas monitoring, and dust observation. Section 8.3.4 states that a review of air quality monitoring results (from the subsurface, surface and building accumulation monitoring programs) is completed as part of the Annual Review. The Independent Auditor recommended, following their site inspection, that WCC evalue and report the effectiveness of the air quality management system, particularly in relation to odour. See the OFIs under Schedule 4 Condition 23 and 26.	
		• is capable of evaluating the performance of the landfill;						
		• includes a protocol for determining any exceedances of the relevant conditions of approval and responding to complaints;						
		• adequately supports the air quality management system; and						
		• evaluates and reports on the effectiveness of the air quality management system.						
		This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).		The Plan is documented in Section 8.0 of LEMP.			The AQMP is documented in Section 8.0 of the LEMP.	
Greenhouse gas management plan	30	The Proponent must develop and implement a **Greenhouse Gas Management Plan** prior to the commencement of operation of the new landfill cells. This plan must include, as a minimum:	Section 8.5 of LEMP defined the Greenhouse Gas Management Plan Whytes Gully Landfill Methane Gas Monitoring data - accumulation Whytes Gully Landfill Methane Gas Monitoring – Wells Gas analysis records in April 2017.	The following greenhouse gas reduction measures are defined in the LEMP to be implemented by WCC.	Compliant	LEMP Section 8.5 Greenhouse Gas Management Plan	A Greenhouse Gas Management Plan is located in Section 8.5 of the LEMP, which included management strategies to be implemented at the landfill to reduce potential GHG emissions from the landfill and save energy. While not observed by Cardno, the Independent Auditor observed flaring being conducted during site inspections, and viewed records and audit inspections that confirmed plant and equipment were maintained to reduce emissions.	Compliant
	(a)	final details of the landfill gas management system including flaring and/or combustion to reduce potential greenhouse gas emissions from the landfill;		Flaring was being conducted and was observed during site inspections.				
	(b)	energy saving measures to be implemented; and		Based on the records and audit inspection the following were noted: - Plant and equipment were maintained to reduce emissions - Flaring was conducted of methane capture in some areas of the landfill.				
	(c)	include a program to monitor the effectiveness of these measures, and a protocol to periodically review the plan.		WCC reported that greenhouse gas emissions are monitored continuously and reported via a contract provider monthly to assess the effectiveness and efficiency of the landfill gas management system. The effectiveness of the system is reported quarterly to Council as part of Council's annual plan. Internal annual sustainability reporting is also conducted which includes an annual review of greenhouse gas emissions at the landfill and assesses opportunities to implement further energy and greenhouse gas emissions improvements. An example action from the energy use review has resulted in the installation of solar photovoltaic energy at the Whytes Gully site. The solar photovoltaic system is now operational. This system was not sighted by Auditors. WCCs Annual Report includes the following text on page 20: "Greenhouse gas emissions reduction projects: This program is helping to reduce Council's greenhouse gas emissions by establishing and delivering an array of projects that provide carbon abatement. Various projects that have the potential to reduce Council's carbon footprint were progressed during the year. The largest project under way was the Whytes Gully landfill gas capture and flaring project which successfully stopped approximately 660 tonnes of methane gas from being released into the atmosphere. Other carbon abatement projects including solar photovoltaic cell installations and high efficiency lighting upgrades were also completed." No review of the plan has been conducted since the LEMP was developed in 2014. WCC did not demonstrate how they have assessed the effectiveness of energy saving measures. Based on the information provided, WCC are not compliant with part c of the Condition. Recommendation: WCC to review the LEMP and subplans to: assess the extent of implementation; assess the effectiveness of the landfill gas management system and energy saving measures; and update the plan to address current site practices.	**Non-compliant**		As discussed in Section 8.5 of the LEMP, the effectivness of these measures will be through the review of performance indicators from GHG emissions and energy savings. WCC reported that greenhouse gas emissions are monitored continuously and reported via a contract provider monthly to assess the effectiveness and efficiency of the landfill gas management system. The effectiveness of the system is reported quarterly to Council as part of Council's annual plan. Internal annual sustainability reporting is also conducted which includes an annual review of greenhouse gas emissions at the landfill and assesses opportunities to implement further energy and greenhouse gas emissions improvements. However, the Independent Auditor noted that a review of the GHG plan has not been completed.	**Non-compliant**
		This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).		Documented in LEMP Section 8.5.			Documented in LEMP Section 8.5.	Compliant
Noise								

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Noise limits	31	The Proponent shall ensure that the noise generated by the operations on site does not exceed the criteria in Table 6 at any private residential receiver.	Appendix M of the LEMP – Noise Management Plan Whytes Gully New Landfill Construction – Select Civil Noise Monitoring Report dated 25 November 2013 Whytes Gully New Landfill Construction – Select Civil Noise Monitoring Report dated 02/07/2014	Appendix M of the LEMP – Noise Management Plan defines noise mitigation and monitoring required. The Plan does not require noise monitoring to be conducted specifically for operations, however does require Contractors to conduct noise monitoring during construction activities. Noise monitoring assessments were conducted during construction, and noise monitoring reports for construction were provided. The reports indicated that noise criteria were not exceeded for periods of construction. During these periods operations were ongoing, hence it is considered the monitoring is likely to be useful in verifying compliance to this condition.	Compliant	LEMP Appendix M Noise Management Plan	Appendix M of the LEMP - Noise Management Plan outlines that noise monitoring is required during construction activities, and does not specify requirements for operational activites. While not sighted by Cardno, the Independent Auditor viewed reports for noise monitoring conducted during construction, which indicated that the noise criteria was not exceeded for periods of construction. As indicated by the Independent Auditor, noise monitoring is considered useful in veryfying compliance with this condition for operational activities. The Project Approval states that noise monitoring is required to occur at the properties of five residential receivers, as identified in Appendix 6 of the Project Approval. A quote from a specialist noise consultant (ERM) has been obtained for operation noise monitoring work, however no noise monitoring has been undertaken to date. Based on a review of the complaint register for the site, no noise-related complaints have been received from the date of commencement to the end of the reporting period, however a noise-related comment was raised at the Whytes Gully Reference Group Meeting minutes dated 22 November 2017 relating to the "pitch of the compactor and loaders reversing signals.	**Non-Compliant**
Operating conditions	32	The Proponent shall:	LEMP Section 9.7 Noise Control and Appendix M Site inspection East Cape Contractor Service Maintenance Records and noise monitoring ERTECH Premobilisation Checklist					
	(a)	implement best management practice, including all reasonable and feasible noise management and mitigation measures to prevent and minimise operational, low frequency and traffic noise generated by the project;		Based on the complaint register there was no record of noise complaints. WCC operations work within standard operating hours and maintenance of plant and equipment is undertaken. The Whytes Gully Reference Group Meeting minutes dated 22 November indicated a community representative mentioned "the pitch of the compactor and loaders reversing signals". WCC indicated this was to be investigated. OFI: Ensure all plant use low frequency reversing alarms.	**Compliant OFI**	LEMP Section 9.7 Noise Controls and Appendix M Site Inspection	Based on a review of the complaint register for the site, no noise-related complaints have been received from the date of commencement to the end of the reporting period. However a noise-related comment was raised at the Whytes Gully Reference Group Meeting minutes dated 22 November 2017 relating to the "pitch of the compactor and loaders reversing signals. WCC confirmed that this comment is being investigated and confirmation is yet to be received relating to the use of low frequency reversing alarms on all plant. WCC construction and operational activities, including the maintenance of plant and equipment, is undertaken within standard operating hours.	**Compliant OFI**
	(b)	minimise the noise impacts of the project during adverse meteorological conditions when noise criteria do not apply;		Construction works only during standard hours. Noise monitoring assessments were conducted during construction contractors. Noise monitoring reports for construction were provided as evidence. It was noted that noise criteria were not exceeded.	Compliant		WCC construction and operational activities, including the maintenance of plant and equipment, is undertaken within standard operating hours. While not sighted by Cardno, the Independent Auditor confirmed that noise monitoring assessments were conducted during construction and nosie criteria were not exceeded.	Compliant
	(c)	maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired; and		Plant and equipment inspection records were provided as evidence. No works outside standard hours.	Compliant		WCC confirmed that no noise suppression is currently used on plant at the site. While not sighted by Cardno, the Independent Auditor sighted plant and equipment inspection records and confirmed that plant use at the site was compliant with this condition.	Compliant
	(d)	regularly assess noise monitoring data and relocate, modify and/or stop operations to ensure compliance with the relevant conditions of this approval.		Noise monitoring has been conducted and selected results provided. No noise complaints have been received during construction. Plant and equipment were inspected and maintained. High noise levels were not observed during site inspections.	Compliant		While not confirmed by Cardno, the Independent Auditor stated that noise monitoring has been conducted and selected results were provided, plant and equipment are inspected and maintained at the site, and high noise levels were not observed during site inspections. No noise complaints have been received during construction.	Compliant
Operating hours	33	~~The Proponent shall comply with the construction and operating hours detailed in Table 7 for the site, unless otherwise agreed in writing by the Director-General.~~		(Omitted due to Modification 1)			(Omitted due to Modification 1, discussed in Modification 1 table)	
Noise management plan	34	~~The Proponent shall prepare and implement a Noise Management Plan for the project in consultation with the EPA and to the satisfaction of the Director-General. The plan must:~~		(Omitted due to Modification 1)			(Omitted due to Modification 1, discussed in Modification 1 table)	
	~~(a)~~	~~be prepared and implemented by a suitably qualified and experienced person whose appointment has been approved by the Director-General;~~						
	~~(b)~~	~~be approved by the Director-General prior to the commencement of construction;~~						
	~~(c)~~	~~describe the measures that will be implemented to minimise noise from the construction and operation of the project and ensure:~~						
		~~• best management practice is employed on site;~~						
		~~• implementation of traffic noise management measures;~~						
		~~• the noise impacts of the project are minimised during adverse meteorological conditions; and~~						
		~~• compliance with the relevant conditions (including noise limits) of this approval.~~						
	~~(d)~~	~~describe the noise management system;~~						
	~~(e)~~	~~includes a noise monitoring program that:~~						
		~~• is capable of evaluating the performance of the project;~~						
		~~• includes a protocol for determining exceedances of the noise limits in this approval and responding to complaints;~~						
		~~• adequately supports the noise management system; and~~						
		~~• evaluates and reports on the effectiveness of the noise management system.~~						
	~~(f)~~	~~include a description of the remedial actions that may be implemented in the event of a non-compliance with the noise limits in this approval.~~						
		~~This plan must be documented in the CEMP and Landfill EMP (see Conditions 2 and 3 in Schedule 5).~~						
Transport								
Traffic monitoring	35	The Proponent shall:	August 2017 Weighbridge hours 18 September 2017 Ertech Stage 2 and 3 Traffic Management Plan	Volume of waste transported to the site are measured on the Weighbridge and documented in spreadsheets sighted. Traffic Management Plan included the haulage route for construction heavy vehicles for deliveries.	Compliant	CEMPF Appendix A Construction Traffic Management Plan	While not confirmed by Cardno, the Independent Auditor confirmed that waste volume records were compliant with this condition.	Compliant
	(a)	keep accurate records of the volume of waste transported to the site;						
	(b)	nominate a haulage route to be used by heavy vehicles accessing the landfill consistent with the traffic assessment in the EA; and					A Construction Traffic Management Plan was prepared by GTA Consultants, and is included in Appendix A of the CEMP Framework. This plan outlines the haulage route to be used by heavy vehicles outside of the site. While not sighted by Cardno, the Independent Auditor confirmed that the Ertech Traffic Management Plan included the haulage route for construction heavy vehicles for delivery in compliance with this condition. Internal access roads to the landfill cells was proposed (Section 4.3) to be relocated once the individual landfill cells reach the end of their life cycle, and any changes to the internal road network would be subject to future detailed design. Therefore, it is assumed that there are no internal haulage route changes to the present situation.	
	(c)	make these records available in its Annual Report.					A summary of waste streams and total tonnage of waste received at the site is provided in the Annual Review 2017-2018.	
Operating conditions	36	The Proponent shall ensure that:	August 2017 Weighbridge hours 18 September 2017 Site inspection	This audit did not assess compliance with the Australian Standards referenced, hence construction of the roads etc. to these standards was not assessed as Auditors are not traffic experts. The swept path of the longest vehicle entering the site was not assessed during the audit. No queuing of vehicles noted during the site audit, however it was indicated that some waste trucks are likely to queue on the road outside the facility before 7:30 am waiting for the site and weighbridge to be opened. Due to the extra lane on the road adjacent to the entrance to the facility, trucks are able to queue and not obstruct local traffic. During operating hours, there is room for vehicles to queue on site prior to having to stop. Consultation with RMS did not identify any traffic related issues relating to WCC Operations. Auditors did not observe trucks queuing on public roads, and hence were unable to verify from observation the extent and nature of queuing on public roads. Hence auditors were not able to verify if WCC are not compliant with sub conditions c, d and e. Loading and unloading is carried out on site, and traffic management noted to be in good control during site audit, hence compliance was verified with sub-conditions f and g. Recommendation: That WCC confirm with RMS that current arrangements related to trucks parking outside the facility prior to opening is acceptable, and notify DPE of the outcomes of this consultation.		Integrated Operational Management Plan - Site Safety, Emergency and Business Continuity Management Plan (SSEBCMP)		
	(a)	internal roads, driveways and parking (including grades, turn paths, sight distance requirements, aisle widths, aisle lengths and parking bay dimensions) associated with the project are constructed and maintained in accordance with the latest versions of AS 2890.1 and AS 2890.2;			Not assessed		The Independent Auditor did not assess the compliance with this condition, and design has not been provided to confirm compliance.	Not assessed
	(b)	the swept path of the longest vehicle entering and exiting the subject site, as well as manoeuvrability through the site, is in accordance with AUSTROADS;			Not assessed		The Independent Auditor did not assess the compliance with this condition, and design has not been provided to confirm compliance.	Not assessed
	(c)	the project does not result in any vehicles queuing on the public road network;			**Not verified**		WCC acknowledge that vehicles quuing on the public road network occurs occasionally on Reddalls Road, however have no controls in place to manage this issue. WCC to issue instruction to customers (operational) and contractors (construction) not to arrive at the site prior to site opening hours.	**Non-compliant**
	(d)	heavy vehicles and bins associated with the project do not park or stand on local roads or footpaths in the vicinity of the site;			**Not verified**		WCC acknowledges that parking of heavy vehicles and bins occurs outside the site boundary, and have noted that they are implementing actions to make 'no standing' areas along Reddalls Road. WCC to issue instruction to customers (operational) and contractors (construction) not to arrive at the site prior to site opening hours.	**Non-compliant**
	(e)	all vehicles are wholly contained on site before being required to stop;			**Not verified**		WCC confirmed that the site and placement of the weighbridge has been designed to ensure that all vehicles are wholly contained on site before required to stop. The SSEBCMP confirms that access to the site is controlled through the manned weighbridge, and the site is fully fenced. However, the Independent Auditor could not verify compliance with this condition. WCC to issue instruction to customers (operational) and contractors (construction) not to arrive at the site prior to site opening hours.	**Non-compliant**
	(f)	all loading and unloading of materials is carried out on site; and			Compliant		WCC confirmed that the site has been designed to ensure that all loading and unloading of materials is carried out on site. The SSEBCMP states that access to the site is controlled through the manned weighbridge, and the site is fully fenced. The Independent Auditor confirmed that traffic management at the site is in good control during site audit, and the site was compliant with this condition.	Compliant

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	(g)	the proposed turning areas in the car park are kept clear of any obstacles, including parked cars, at all times.		No issues with obstacles in the car park were observed.	Compliant		While not confirmed by Cardno, the Independent Auditor confirmed that the site was compliant with this condition. The Independent Auditor confirmed that traffic management at the site is in good control during site audit, and the site was compliant with this condition.	Compliant
Intersection upgrade	37	Prior to the receipt of more than 180,000 tpa of waste at the Whytes Gully RRP in any calendar year, or as otherwise directed by RMS, the Proponent must upgrade the intersection of West Dapto Road and the Princes Highway to traffic signals in accordance with WCC's Works Authorisation Deed with RMS, to the satisfaction of RMS.	Princes Highway Reddalls Road Intersection Upgrade design	Princess Highway Reddalls Road Intersection was upgraded as part of the landfill new cell project.	Compliant		As confirmed by the Independent Auditor, the Princess Highway and Reddalls Road Intersection was upgraded as part of the landfill new cell project.	Compliant
Construction traffic management	38	The Proponent shall prepare and implement a **Construction Traffic Management Plan** for the project, to the satisfaction of the Director-General. The Plan shall:	Ertech Stage 2 and 3 Traffic Management Plan CEMPF Section 3.5 Public Road and Impacts	Traffic Management Plan for Ertech was prepared and provided as evidence. Details required in this condition were included in the TMP. Auditors are not traffic experts hence did not conduct a full assessment of this condition.	Compliant	CEMPF Section 3.5 and Appendix A Construction Traffic Management Plan	The CEMPF submitted to DPE included a Public Road and Impacts section (Section 3.5), and a specialist Construction Traffic Management Plan prepared by GTA Consultants (Appendix A). While not sighted by Cardno, the Independent Auditor confirmed that the Traffic Management Plan prepared by Ertech for Stage 2 and 3 construction works included information sufficient to ensure compliance with this condition.	Compliant
	(a)	be prepared in consultation with Council and RMS by a suitably qualified and experienced expert;						
	(b)	be approved by the Director-General prior to the commencement of construction;						
	(c)	include a detailed analysis of the impact of the project on the road network during construction;						
	(d)	detail the measures that would be implemented to manage internal and external road safety and network efficiency including measures to control traffic movements during construction;						
	(e)	detail the access and parking arrangements for the site during construction;						
	(f)	detail the measures to ensure that the local road network is not utilised by vehicles associated with the project during construction; and						
	(g)	if necessary, detail procedures for notifying residents of any potential disruptions to routes and access.						
		This plan must be documented in the CEMP (see Condition 2 in Schedule 5).						
Visual amenity								
Lighting	39	The Proponent shall ensure that the lighting associated with the project:		Lighting or visual amenity management was not included in CEMPF and LEMP. WCC reported that no works (operations or construction) are conducted at night. No lights are kept on at night except for security lights at the weighbridge. Therefore WCC are deemed compliant with this condition as it is largely not relevant.	Compliant		Lighting or visual amenity management was not discussed in the CEMPF or LEMP. WCC reported that no works (operations or construction) are conducted at night. No lights are kept on at night except for security lighting at the weighbridge. Therefore WCC are deemed compliant with this condition as it is largely not relevant.	Compliant
	(a)	complies with the latest version of AS 4282(INT) - Control of Obtrusive Effects of Outdoor Lighting; and						
	(b)	is mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.						
Landscaping	40	The Proponent shall progressively implement the **Landscape Plan** (Appendix 7) following the completion of ground disturbing works across the site, to the satisfaction of the Director-General.	The Landscape Plan	The Landscape Plan (Appendix 7) defines landscaping over areas not yet landfilled and hence are not able to be rehabilitated, hence this condition is not triggered.	Not Triggered	LEMP Appendix L Landscape Strategy LEMP Appendix O Vegetation Management Plan The Landscape Plan (Appendix 7 of the Project Approval)	The Landscape Plan (Appendix 7 of the Project Approval) defines landscaping required, and a Vegetation Management Plan (Appendix O of the LEMP) has been prepared which supersed the Landscape Strategy (Appendix L of the LEMP). This condition has not been triggered as rehabilitation has not been required during the reporting period.	Not triggered
Signage	41	The Proponent shall not install any advertising signs on site without the written approval of the Director-General.	Site Inspection	No advertising was installed around the site perimeter during site audit.	Compliant		WCC confirmed that no advertising signs have been installed at the site, which was confirmed by the Independent Auditor.	Compliant
Hazards								
Pre-construction	42	The Proponent shall prepare the studies set out under subsections 42(a) to 42(b) (the pre-construction studies). Construction, other than of preliminary works that are outside the scope of the hazard studies, shall not commence until study recommendations have been considered and, where appropriate, acted upon.	LEMP Section 8.2.3 HAZOP Study			IOMP Landfill Gas Management System (LGMS) Appendix A LEMP Section 8.2.3 HAZOP Study		
	(a)	Bushfire Risk Management Strategy - A **Fire Management Strategy** for the Project. This strategy shall cover all proposed recommendations and safeguards set out in the Bushfire Report at Appendix M of the EA.		The LEMP (Section 8.2.3) includes an approach to address bushfires. WCC reported that this addresses Condition 42a. Implementation of the Fire Management Strategy as set out in the LEMP was not reviewed during this audit. Auditors are not specialists in bushfire management.	Compliant		The LEMP (Section 8.2.3) includes an approach to address bushfires in compliance with Condition 42(a) of the Project Approval. In addition, Appendix A of the Landfill Gas Management System includes a Bushfire Pre-Construction Report by APZA services (6 August 2013). The Bushfire report reviewed the recommendations and safeguards as provided in the Bushfire Report (Appendix M of the EA) and agreed with all except 5.1.4 (ii) and suggested modification such that tree canopy should be located greater than 2 metres from any part of the roof line of any building rather than 10 meters which was originally proposed.	Compliant
	(b)	**Hazard and Operability Study** - A Hazard and Operability Study (or equivalent) for the proposed landfill gas handling equipment, chaired by an independent qualified person. The study shall be consistent with the Department of Planning's Hazardous Industry Planning Advisory Paper No. 8, 'HAZOP Guidelines'.		A Hazard and Operability Study (HAZOP) was sighted for the Flare that included gas lines, manifolds, pipelines, condensate return lines, compressed air lines and the existing gas header. WCC stated that the HAZOP independence was ensured by the facilitator being independent from RUN Energy who designed the system. Auditors did not assess the HAZOP to the extent to verify if it was completed in accordance Department of Planning's Hazardous Industry Planning Advisory Paper No. 8, 'HAZOP Guidelines'.	Compliant		A Hazard and Operability Study (HAZOP) is included in Section 8.2.3 of the LEMP, and a Landfill gas management system (HAZOP report) dated 26 August 2014 by Golder Associates is included in the Integrated Management Plan. Both HAZOP reports have been approved by DPE as part of the LEMP and IOMP submission and approval. Similarly to that stated by the Independent Auditor, the HAZOP studies were not assessed to confirm if they were completed in accordance with the Department of Planning's Hazardous Industry Planning Advisory Paper No. 8, 'HAZOP Guidelines	Compliant
Pre-commissioning								
Safety Management System	43	Prior to commissioning, the Proponent shall develop and implement a comprehensive **Safety Management System** (SMS), covering all on-site operations. The Safety Management System shall be consistent with the Department of Planning's Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'. The SMS shall include procedures for ensuring the ongoing implementation and integrity of the safeguards identified in the Preliminary Hazard Analysis (PHA) at Appendix L of the EA and in the Bushfire Risk Management Strategy at Appendix M of the EA.	Safety Management Plan SMP dated 2 June 2016 Safety Management Plan SMP Induction TEMPLATE Checklist CURRENT June 2016 Work Health and Safety - Site Specific OHS Procedures - Substance Register Whytes Gully CURRENT 2015 Example of Minutes Site Safety - Whytes Gully - December 2015 Ertech WORKPLACE HEALTH, SAFETY & ENVIRONMENT	WCC reported that the Safety Management Plan dated 22 June 2016 addresses the condition to develop an SMS. This audit did not include an assessment of the implementation of the SMS as this was considered beyond the scope of the IEA. The auditors were not commissioned to assess safety issues or safety compliance.	Compliant	IOMP Site Safety, Emergency and Business Continuity Management Plan (SSEBCMP)	A Site Safety, Emergency and Business Continuity Management Plan has been prepared by Golder (12 June 2013) for the site (as part of the IOMP). While not sighted by Cardno, the Independent Auditor confirmed that a Safety Management Plan dated 22 June 2016 addresses the condition to develop an SMS. The Independent Auditor stated that their audit did not include an assessment of the implementation of the SMS as this was considered beyond the scope of the IEA.	Compliant
Pre-startup								
Pre-startup Compliance Report	44	The Proponent shall submit to the Department a report detailing compliance with Conditions 42 and 43 one month prior to the commencement of operation.		Evidence of reporting requirements as per this condition was not sighted or provided to the auditors. Recommendation: That WCC submit to the Department a report detailing compliance with Conditions 42 and 43; or alternatively discuss the requirement with DPE and determine another approach to meet DPE's requirements.	**Non-compliant**		Evidence of reporting requirements as per this condition were not sighted or provided.	**Non-compliant**
Pest, vermin & noxious weed management	45	The Proponent shall:	Whytes Gully New Landfill Cell Vegetation Management Plan Review Project no. 25059 Updated Vegetation Management Plan by Biosis July 2017 Feral Animal Control - Whytes Gully Weed Control Schedule Various emails regarding organising weed control personnel in 2016 and 2017.	During the site inspections, numerous weeds including noxious weeds were evident across the site. Current weed controls appeared limited and was not able to be explained in detail by WCC. Based on site observations, weed controls measures across the site were not adequate or effective. WCC reported that the site is inspected monthly and control undertaken periodically derived from inspection results. Implementation records provided included: 1) a schedule of weed management visits for all of council's sites. This indicated site visits on 7 occasions were scheduled over 2017; 2) emails discussing various weed areas and requesting weed control services during 2016 and 2017; WCC did not demonstrate that a systematic and through approach is taken to management and control of weeds at the site. Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013). A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outlined in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12-month period, with consideration to the current condition.	**Non-compliant**	LEMP Section 9.5 LEMP Appendix O Vegetation and Biodiversity Management Plan	Section 9.5 of the LEMP contains information regarding the management of vermin and noxious weeds, and a Vegetation and Biodiversity Management Plan is included in Appendix O of the LEMP and includes details of weed management. While not sighted by Cardno, the Independent Auditor sighted various emails regarding organised weed control personnel in 2016 and 2017. In addition, a report by Biosis in 2017 proposed management actions to be undertaken within a 12-month period based on field investigations completed in June 2017. WCC reported that monthly inspection of weeds and vermin at the site, and weed poisoning takes place. However, the Independent Auditor noted numerous weeds (including noxious weeds) across the site during site inspection, and weed control appeared to be limited and were not adequate or effective. Council notes non-compliance with pest species management and the auditors opinion that noxious weed control should be improved. WCC notes that the referenced Biosis report is a document that was created as a specification for contract weed control. Council believes that this document is auxillory to this audit as the implementation of day labor vs contract staff and their relative effectiveness is not in the audit scope.	**Non-compliant**
	(a)	implement suitable measures to manage pests, vermin and declared noxious weeds on site; and						
	(b)	inspect the site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in surrounding area.						
Fire management	46	The Proponent shall:	LEMP Section 9.9 Firefighting Capacity Emergency Evacuation Wollongong Waste and Resource Recovery Park 25	WCC had conducted an emergency evacuation drill on January 2017. The LEMP defined the firefighting management strategy and capacity. WCC indicated that no fire had been reported since 2013. The Auditors are not Fire experts and have not assessed WCC's ability to manage fires at the site or compliance with this condition	**Not Assessed OFI**	LEMP Section 9.9 Firefighting Capacity	Section 9.9 of the LEMP outlines the firefighting management strategy and capacity. WCC indicated that fires at the site have been successfullly managed. Fire extinguishers and water trucks are available on site and are routinely maintained and inspected for suitability. No evidence / record sheets were provided to confirm appropriate implementation of fire management measures at the site in compliance with this condition	**Non-compliant**
	(a)	implement suitable measures to minimise the risk of fire on site, including in the landfill area;						
	(b)	extinguish any fires on site promptly; and						

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Schedule 4 - Specific environmental conditions			**MCW Environmental Consulting Pty Ltd, March 2018**			**Cardno, December 2018**		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Finding**	**Compliance Status & Recommendation**
	(c)	maintain adequate fire-fighting capacity on site.	Resource Recovery Park 2-3 January 2017 Whytes Gully see Z17/25130	compliance with the condition. OFI: WCC conduct a review of their capability to manage fire risk and maintain adequate fire-fighting capacity on site.			measures at the site in compliance with this condition.	
Conservation								
Heritage	47	During the life of the Project, the Proponent shall protect the identified heritage and archaeological sites outside of the Project footprint, in consultation with the Local Aboriginal Land Council, and to the satisfaction of the Director-General.	LEMP figure 8 Heritage LEMP Section 2.4 Cultural Heritage	LEMP Figure 8 demonstrated the heritage and archaeological sites are outside the project footprint. LEMP Section 2.4 defined the management requirement for Cultural Heritage. Reported finds as part the initial EIS and covered under the COA which are located outside the project footprint. WCC reported that there has been no impact to these sites. Auditors did not visit these sites and have relied on WCC information in respect of determining compliance with this condition.	Compliant	LEMP Section 2.4 Cultural Heritage, Figure 8	LEMP Figure 8 demonstrates that heritage areas, Aboriginal Archaeolgoical Sites, and AHIMS results are outside the extent of landfill works area. WCC reported that there has been no impact to these sites.	Compliant
Heritage management	48	The Proponent must prepare:						
	(a)	heritage training and induction processes for construction personnel (including procedures for keeping records of inductions) including site identification, protection and conservation of Aboriginal and historic heritage; and	ERTECH Induction attended by auditors.	Auditors attended an Induction by construction personnel that included heritage.	Compliant	CEMPF Appendix B Cultural Heritage Induction	Appendix B of the CEMPF includes a Cultural Heritage Induction for the site. While not confirmed by Cardno, the Independent Auditor attended an induction by ERTECH construction personnel that included heritage.	Compliant
	(b)	procedures for dealing with heritage items including human remains, including cessation of works in the vicinity and notification of the Department, NSW Police Force (in the case of human remains), OEH and registered Aboriginal stakeholders and not recommencing any works in the area unless authorised by the NSW Police Force and/ or the Department.	CEMPF Section 3.10 Archaeological and Heritage Protection Plan	Procedure is defined in the CEMP and LEMP. Implementation not yet triggered as WCC reported that there has been no finds to date. The Heritage items noted in the EA were outside the construction boundary.	Compliant	CEMPF Section 3.10 Archaeological and Heritage protection Plan	Section 3.10 of the CEMPF includes mitigation measures in the event that Unanticipated Aboriginal Cultural materials are discuvered, or Unanticipated Historical Relics are discovered. Implementation has not yet been triggered as WCC reported that there have been no finds to date.	Compliant
		These procedures must be documented in the CEMP (see Condition 2 in Schedule 5).		Documented in CEMPF Section 3.10 Archaeological and Heritage Protection Plan.	Compliant		Procedures for dealing with heritage items is included in CEMPF Section 3.10 Archaeological and Heritage Protection Plan.	Compliant
~~Vegetation and biodiversity management~~	~~49~~	~~The Proponent shall prepare and implement a Vegetation Management Plan for the project to the satisfaction of the Director-General. This plan must:~~		(Omitted due to Modification 2)			(Omitted due to Modification 2, discussed in Modification 2 table)	
	~~(a)~~	~~be prepared by a suitably qualified and experienced expert;~~						
	~~(b)~~	~~be approved by the Director-General prior to the commencement of construction;~~						
	~~(c)~~	~~include a vegetation clearing protocol (see Condition 50 of this Schedule);~~						
	~~(d)~~	~~must specifically include a Biodiversity Offset Strategy that:~~						
		~~• is assessed against the OEH's 'Principles for the Use of Biodiversity Offsets in NSW' and the 'Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, SSD and SSI Projects';~~						
		~~• details the proposed offset measures to be implemented and secured for removing 0.49 hectares of native vegetation (including 0.01 hectares of Illawarra Subtropical Rainforest);~~						
		~~• identify conservation mechanisms to be used to ensure the long term protection and management of the offset sites;~~						
		~~• references best practice management guidelines for restoring and managing the vegetation communities proposed for protection;~~						
		~~• details how the proposed offset measures will be protected, managed, funded and monitored over the life of the project;~~						
	~~(e)~~	~~ensure the project maintains suitable buffer distances to nearby waterways in accordance with Wollongong DCP 2009 to protect riparian land; and~~						
	~~(f)~~	~~details the site-wide ecological management and monitoring program/s to be implemented for the life of the project.~~						
		~~This plan must be documented in the Landfill EMP and CEMP (see Conditions 2 and 3 in Schedule 5).~~						
	50	The Vegetation Clearing Protocol must:	CEMP Appendix C Vegetation Management Plan 2013 Updated Vegetation Management Plan July 2017 Completion of pre-clearance surveys and habitat removal supervision at Whytes Gully Resource Recovery Park, Kembla Grange 2 March 2017	A Vegetation Clearing Protocol was provided in the DPE approved 2013 Vegetation Management Plan. Pre-clearance surveys and habitat removal supervision report by Biosis was provided as evidence of implementation.	Compliant	LEMP App O and CEMP Appendix C - Vegetation and Biodiversity Management Plan 2013	A Vegetation Clearance Protocol is located in the Vegetation and Biodiversity Management Plan 2013, which has been approved by DPE. While not sighted by Cardno, the Independent Auditor sighted pre-clearance surveys and habitat removal supervision reports by Biosis that confirm complaince with this condition.	Compliant
	(a)	clearly identify the location and type of vegetation to be retained and to be removed from the site;						
	(b)	detail measures that would be implemented for vegetation clearing;						
	(c)	ensure vegetation, including trees would not be pushed or felled into any retained bushland areas during the vegetation removal process;						
	(d)	detail procedures to manage impacts on fauna including translocation of fauna by a suitably qualified ecologist/wildlife rescuer (if appropriate); and						
	(e)	detail the staging of construction to avoid breeding times for key species on site.						
Landfill closure and rehabilitation	51	The Proponent shall prepare and implement a **Rehabilitation Management Plan** for the landfill to the satisfaction of the Director-General. This plan must:	Section 10 of LEMP Site Closure Section 10.2 Site capping and revegetation	Rehabilitation Management Plan was defined in Section 10.2 of LEMP as Site Capping and Revegetation. The implementation is not yet triggered as landfilling is ongoing with no areas available to rehabilitate. No rehabilitation works have been conducted to date,	Compliant	LEMP Section 10 Site Closure, Section 10.2 Site capping and revegetation LEMP Appendix I Whytes Gully New Landfill Cell Preliminary Design Report and Whytes Gully Resource Recovery park Detailed Design Report - Tender Packages 1, 2 and 3	Rehabilitation management Plan was defined in Section 10.2 of LEMP, which was submitted to DPE and approved as part of the LEMP. The implementation is not yet triggered as landfilling is ongoing with no areas available to rehabilitate. No rehabilitation works have been conducted to date. The propsoed time periods for capping and rehabilitation for each of the stages is provided in Appendix I of the LEMP.	Compliant
	(a)	be prepared in consultation with the OEH by a suitably qualified and experienced expert;						
	(b)	be submitted to the Director-General for approval within six (6) months of the date of this approval;						
	(c)	be undertaken in a manner which is complementary with the rehabilitation is consistent with the proposed final landform depicted in the figures in Appendices 4 and 7;						
	(d)	specify a time period for the rehabilitation to works to commence and be finalised following cessation of landfill activities; and						
	(e)	be documented in the Landfill EMP (see Condition 3 in Schedule 5).						

WHYTES GULLY LANDFILL EXPANSION PROJECT - Minister's Condition of Approval 11_0094			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
Schedule 5 - Environmental Management, Reporting and Auditing			**MCW Environmental Consulting Pty Ltd, March 2018**			**Cardno, December 2018**		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Finding**	**Compliance Status & Recommendation**
Community education program	1	The Proponent shall prepare and implement a **Community Education Program** for the project to the satisfaction of the Director-General. This program must be submitted to the Director-General for approval prior to the commencement of operation, and shall at a minimum focus on promoting resource recovery activities provided at the site.	Appendix P of LEMP	Community Education Program was prepared as part of the LEMP and is assumed to have been approved as part of the LEMP approval. Implementation was demonstrated by providing brochures to the community and recycling transfer area for small vehicle and community recycling area was built.	Compliant	LEMP Appendix P Community Education Program	Appendix P of LEMP is the Community Education Program, and was submitted and approved by DPE as part of the LEMP. The Community Education Program includes a number of education programs with the overall aim of promoting reduce, reuse and recycle of waste. These programs include workshop delivery programs at the Discovery Centre to reuse food and organic waste, and raising awareness of specific waste services during National Recycling Week talks. WCC indicated that the Community Education Program is in operation at the Botanic Gardens through education programs. While not sighted by Cardno, the Independent Auditor confirmed that implementation was demonstrated by the provision of brochures to teh community and recycling transfer area for small vehicle and community recycling area that has been constructed.	Compliant
Environmental management								
Construction environmental management plan	2	The Proponent shall prepare and implement a **Construction Environmental Management Plan** for the project to the satisfaction of the Director-General. The Plan must:	Construction Environmental Management Plan Framework (CEMPF) August 2013	The CEMPF was prepared by Golder Associates in August 2013 and was submitted to DPE for approval on 20 August 2013. The CEMPF satisfy these requirements of the conditions of approval. OFI: The Construction Environmental Management Plan has not been updated since 2013. It is suggested that WCC review and update the plan to ensure its alignment with changes on site; and relevant EPL variations. The ERTECH CEMP was provided as evidence of compliance for construction activities. WCC reported that they conduct a review of the Contractor's CEMP against the requirements of the CEMPF. The Auditors did not assess the ERTECH CEMP for compliance against the CEMPF or sight this review. A Pre-Start Review of the adequacy of Environmental Management Plans – Checklist for ERTECH was conducted on 14/03/17 prior to commencing construction work.	**Compliant OFI**	CEMPF Sections 1.3, 2.1, 2.2, 2.3, 3.0, 4, 9, and appendices	The CEMP Framework was prepared by Golder Associates in August 2013 and was submitted to DPE for approval on 20 August 2013. The CEMPF satisfies the requirements of the conditions of approval. However, as outlined by the Independent Auditor, the CEMPF has not been updated since 2013. While not sighted by Cardno, the ERTECH CEMP was provided as evidence of compliance for construction activities, which WCC reviews against the requirements of the CEMPF.	**Compliant OFI**
	(a)	be approved by the Director-General prior to the commencement of construction;	DPE Approval letter dated 20 August 2013					
	(b)	identify the statutory consents and approvals that apply to the project;	CEMPF Section 2.1					
	(c)	include a copy of all relevant management plans and monitoring programs required under this approval;	CEMPF Section 2.2 and 2.3					
	(d)	outline all environmental management practices and procedures to be followed during construction and demolition works associated with the project;	CEMPF Section 3.0 and Appendices					
	(e)	describe all activities to be undertaken on the site during construction of the project, including a clear indication of construction stages;	CEMPF Section 3.0 and Appendices CEMPF Section 4 CQAP					
	(f)	detail how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts;	CEMPF Section 3					
	(g)	describe of the roles and responsibilities for all relevant employees involved in construction and demolition works associated with the project;	CEMPF Section 1.3					
	(h)	include arrangements for community consultation and complaints handling procedures during construction and demolition; and	CEMPF Section 9					
	(i)	be placed on Council's website within 2 weeks of its approval.		The copy of the CEMPF or contractor CEMP were not posted in WCC website. Recommendation: It is recommended that WCC place the CEMPF on the WCC website.	**Non-compliant**		The CEMPF has been placed on the WCC website.	Compliant
Landfill environmental management plan	3	Prior to the commencement of operation, the Proponent shall update the draft **Landfill Environmental Management Plan** in the EA for the site to the satisfaction of the Director-General. This plan must:	LEMP September 2014	The LEMP has been prepared by Golder Associates and was approved by DPE on 11 December 2014.	Compliant	LEMP September 2014	The LEMP has been prepared by Golder Associates and was approved by DPE on 11 December 2014.	Compliant
	(a)	be prepared by suitably qualified and experienced experts whose appointment has been endorsed by the Director-General;	Prepared by Golder Associates				The LEMP was prepared by Golder Associates	Compliant
	(b)	be prepared in consultation with the EPA and other relevant government agencies;	LEMP Section 1.3 Consultation	The LEMP was sent to and reviewed by the EPA and other relevant authorities as per Section 1 of LEMP.	Compliant	LEMP Section 1.3 Consultation	The LEMP was sent to and reviewed by the EPA and other relevant authrotieis as per Section 1 of the LEMP	Compliant
	(c)	be approved by the Director-General prior to the commencement of operation;	LEMP Approval letter by DPE on 11 December 2014	The LEMP was approved by DPE on 11 December 2014.	Compliant		While not sighted by Cardno, a letter dated 11 December 2014 from DPE provided approval of the LEMP	Compliant
	(d)	describe in detail the management measures that would be implemented to address:	LEMP Section 3.1	Described in Section 3.1	Compliant	LEMP Sections 1.1, and 4-11	Management measures are discussed in Sections 4 to 11 of the LEMP	Compliant
		• the relevant matters referred to in the Environmental Guidelines for Solid Waste Landfills;					Section 1.1 states that the LEMP follows the expected format of the criteria established in the NSW Environmental Guidelines: Solid Waste Landfills (EPA, 1996).	
		• the conditions of this approval; and					Reference to the Project Approvals are provided throughout the LEMP, and appropriate management measures to address these requirements is provided.	
		• requirements of the EPL;					Each chapter of the LEMP provides an outline of the EPL licence conditions and a response.	
	(e)	include a copy of:	Section 6, 7, 8 LEMP Appendix E Whytes Gully Landfill Surface Water and Leachate Management Plan, 2008	Included relevant plans and programs.	Compliant	LEMP Sections 7 and appendices		Compliant
		• the relevant plans and programs required under this approval;					All relevant plans and programs are provided as an appendix to the LEMP	
		• a quality assurance plan for the design and installation of the leachate management system and any capping of the landfill cells that covers the relevant issues outlined in sections 1 – 2 of Appendix A of the Environmental Guidelines for Solid Waste Landfills;					Section 7 of the LEMP includes monitoring measures to ensure quality assurance.	
	(f)	describe the procedures that would be implemented to:	LEMP Section 11 Appendix G Complaints Register Appendix P Community Education Program	Procedures and plans included in the LEMP Appendices and process defined in Section 11.	Compliant			Compliant
		• keep the local community and relevant agencies informed about the operation and environmental performance of the Project;				LEMP Section 11, Appendix P Community Education Program	Relevant agencies are informed of the environmental performance of the Project via reporting requirements, as outlined in Section 11 of the LEMP. Appendix P outlines the Community Education Program.	
		• receive, handle, respond to, and record complaints;				LEMP Section 4.3, Appendix G Complaints Register	Section 4.3 of the LEMP outlines the procedures for complaints management. A complaints register form is provided in Appendix G of the LEMP. Sections of the LEMP provides corrective actions in the	
		• resolve any disputes that may arise during the course of the Project; and						
		• respond to emergencies;				LEMP Section 9.9, 9.10	Section 9.9 discusses firefighting capacity, and Section 9.10 discusses flood emergency procedures. In addition, all emergency reponse information is provided in the Site Safety, Emergeny and Business Continuity Management Plan in the Integrated Operational Management Plan.	
	(g)	describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the Project; and	LEMP Section 4	Structure and Responsibility defined in LEMP Section 4.0	Compliant	LEMP Section 4.3	Staffing structure and responsibilities are provided in Section 4 of the LEMP.	Compliant
	(h)	be placed on Council's website within 2 weeks of its approval.		At the time of the audit site inspections (hence for the audit period), the Draft LEMP was posted in DPE website, and the final LEMP was not posted on the WCC website. Recommendation: It is recommended that WCC post the Final LEMP on the WCC website. As of 26 February, the Final LEMP was located on the WCC website.	**Non-compliant**		The LEMP has been included on WCC's website.	Compliant
Management plan requirements	4	The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	CEMPF August 2013 Approval Letter from NSW DPI ref 11/19432 LEMP, 11/12/2014 Approval letter from NSW DPE ref 14/19958	The LEMP and CEMPF and their associated sub-plans were developed and approved by DPE. Management plans have been submitted to DPE for review and approval in compliance to these requirements. The plans were approved on the following dates: • CEMPF 20 August 2013 Approval Letter from NSW DPI ref 11/19432 • LEMP, 11/12/2014 Approval letter from NSW DPE ref 14/19958 The auditors have not assessed the plans against this condition and assume that they have been complied with based on the approval from DPE.	Compliant	CEMPF, LEMP	The LEMP and CEMPF and their associated sub-plans were developed and approved by DPE. While Cardno did not sight approval letters, the Independent Auditor confirmed that approval for both documents had been provided. All required management plans have been included in the body of the LEMP - Water Quality Management (Chapter 7), Air Quality Management (Chatper 8).	Compliant
	(a)	detailed baseline data;		Detailed baseline data documented in LEMP and CEMPF subplans.		LEMP Appendix K	Appendix K Baseline Data Assessment Report provides baseline data for surface water, leachate and groundwater investigations. All other baseline data is provided in the appendixed reports to the LEMP.	
	(b)	a description of:		Documented in LEMP and CEMPF		CEMPF, LEMP	Documented in LEMP and CEMPF	
		• the relevant statutory requirements (including any relevant approval, licence or lease conditions);						
		• any relevant limits or performance measures/criteria; and						
		• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;						
	(c)	a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
	(d)	a program to monitor and report on the:		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
		• impacts and environmental performance of the Project;		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
		• effectiveness of any management measures (see c above);		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
		• a contingency plan to manage any unpredicted impacts and their consequences;		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
		• a program to investigate and implement ways to improve the environmental performance of the project over time;		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
	(e)	a protocol for managing and reporting any:		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
		• incidents;		Documented in LEMP and CEMPF			Documented in LEMP and CEMPF	
		• complaints;						
		• non-compliances with statutory requirements; and						
		• exceedances of the relevant limits and/or performance measures / criteria; and						

WHYTES GULLY LANDFILL EXPANSION PROJECT - Minister's Condition of Approval 11_0094			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
Schedule 5 - Environmental Management, Reporting and Auditing			**MCW Environmental Consulting Pty Ltd, March 2018**			**Cardno, December 2018**		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Finding**	**Compliance Status & Recommendation**
	(f)	a protocol for periodic review of the plan.		The requirement for periodic review is documented in the LEMP and CEMPF. Based on discussions with WCC, annual reviews of the LEMP and CEMPF were not conducted. The latest version of the LEMP and CEMPF were dated 2014. Following issue of the Draft Report, WCC indicated that they consider completing the checklist provided in Section G of the EPL Annual Return as a review of the adequacy of the LEMP and CEMPF. Recommendation: Implement a formal review process for the LEMP and CEMPF. Where relevant and based on the findings of the review, update the LEMP.	**Non-compliant**	LEMP Chapter 8.3.4	Provided in the body of the LEMP in the section addressing the relevant management plan. Eg Annual review of monitoring plans outlined in Section 8.3.4 of the LEMP	**Non-compliant**
Annual review	5	One year after the commencement of operation, and annually thereafter, the Proponent shall **review** the environmental performance of the Project to the satisfaction of the Director-General. This review must:	Whytes Gully WWARRP - Annual Report and Annual Return 29 May 2016 - 28 May 2017	WCC provided Annual Reports that incorporate Annual Returns required under the Environmental Protection Licence for the years 2012-2013 to 2016-2017. The objective of the Annual Report is stated as being required under Condition R1.8 of the EPL which specifies that WCC must provide an Annual Report to accompany the Annual return for the site. The objective does not appear to reflect the requirements of this condition within the Project Approval. The Annual Report address some of the requirements of the condition, however, these reports do not consider compliance with the Project Approval nor meet all aspects of this condition. Specifically, the reports do not cover the following aspects of the condition: - 5a) describe the operations that were carried out in the last year; - 5b) third bullet point: Provide a comparison of results against the relevant predictions in the EA; or - 5c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; In summary, WCC are compliant with many aspects of the condition, however, the scope of current reports do not address some aspects of the condition. Recommendation: It is recommended WCC increase the scope of the Annual Reports to address all of the requirements of Condition 5 (Schedule 5) specific to the Project Approval.	**Non-compliant**	Annual Review 2017-2018	This Annual Review meets the requirements of this condition. This Annual Review is the first of its kind under the Project Approval since operation commenced in 2013. While the report focuses on covering the period 29 May 2017 to 28 May 2018 to coincide with EPL reporting requirements, it also provides reference to results since project approval on 3 April 2013.	Compliant following approval from Director-General
	(a)	describe the operations that were carried out in the past calendar year;					Section 2 of the Annual Review	
	(b)	analyse the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the					Sections 3 and 4 of the Annual Review	
		• relevant statutory requirements, limits or performance measures/criteria;						
		• monitoring results of previous years; and						
		• relevant predictions in the EA;						
	(c)	identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;					Section 5 of the Annual Review	
	(d)	identify any trends in the monitoring data over the life of the Project;					Section 6 of the Annual Review	
	(e)	describe what actions will be implemented over the next year to improve the environmental performance of the project (including a timeline for the completion of each action); and					Section 7 of the Annual Review	
	(f)	be placed on Council's website within 2 weeks of its completion.					Following the completion of this Annual Review, this document will be uploaded to WCC's website.	
Review of plans and programs	6	Within 3 months of the submission of an:						
	(a)	audit under Condition 9 of Schedule 5;		Not yet applicable at this stage. This is the first audit commissioned by WCC.	Not applicable		Various non-compliances were identified by the first Independent Environmental Audit commissioned by WCC, and to date revision of plans and programs has not been completed as recommended by the audit.	**Non-compliant**
	(b)	incident report under Condition 7 of Schedule 5; and		No incident was reported to have occurred to trigger changes or revisions of Plans.	Not applicable		No incidents were reported to have occurred to trigger notification to DPE or subsequent changes or revisions of plans.	Not applicable
	(c)	annual review under Condition 5 of Schedule 5,		WCC to ensure that revisions of the plans and programs be conducted after the annual review as per above. If the audits and reviews of the plans had been carried out as required of the condition, this condition would have been triggered.	Note		Not yet applicablle at this stage. This Annual Review is the first of its kind for WCC.	Not applicable
		the Proponent shall review, and if necessary revise the plans and programs required under this approval to the satisfaction of the Director-General.		See Recommendations for Conditions 4 and 5 above.			See the notes in the sections above for (a), (b) and ©	
Reporting								
Incident	7	The Proponent shall notify the Director-General and any other relevant agencies of any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment associated with the project as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of this incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident.	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	Incidents and non-compliances reported to EPL are recorded in the Annual Returns and these are kept on Councils publicly accessible website. None of the incidents reported were considered by WCC to comprise "actual or potential significant off-site impacts on people or the biophysical environment", hence no incidents were reported to DPE during the reporting period.	Compliant	WCC website	Incidents and non-compliances reported to EPL are recorded in the Annual Returns and these are kept on Councils publicly accessible website. None of the incidents reported were considered by WCC to comprise "actual or potential significant off-site impacts on people or the biophysical environment", hence no incidents were reported to DPE during the reporting period.	Not applicable
Regular	8	The Proponent shall provide regular reporting on the environmental performance of the Project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval, and to the satisfaction of the Director-General.	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.Aspx	The following regular monitoring and reporting are posted on the WCC website: • Environmental Protection Licence 5862 - Annual Return • Whytes Gully Groundwater Monitoring -Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring - Conducted annually in August, and after any overflow event caused by rain • Whytes Gully Air Monitoring -Conducted monthly Auditors have not gone through all management plans to ascertain reporting requirements for each plan, and whether they have been included on the website.	Compliant	WCC website	Council currently provides regular reporting on environmental performance that includes: Annual Returns as required by the EPL (annual), Groundwater monitoring (annual and quarterly), bores and surface water monitoring (quarterly and annual), surface water monitoring (annual and overflow monitoring), air monitoring (monthly), and dust deposition monitoring (monthly). No noise monitoring provided on website.	**Non-compliant**
Independent environmental audit	9	Within a year of the commencement of operation of the project, and every 5 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an **Independent Environmental Audit** of the Project. This audit must:	This audit	This audit is the first audit to be commissioned by WCC since Approval for the Project and since Stage 1 operation of new cell commencing in 2014. To comply with this condition an audit was required in 2015. An independent environmental audit was not conducted a year after commencement of operation of Stage 1, hence WCC are non compliant with the timing related to this condition.	**Non-compliant**	Independent Environmental Audit, 2018	The first Independent Environmental Audit was completed by MCW Environmental Consulting and submitted to DPE on 20 April 2018. As this audit was not conducted a year after commencement of operation of Stage 1, WCC are non-compliant with this condition. The next Independent Environmental Audit is anticipated to be submitted in 2023 or five years from the submission of the first audit.	**Non-compliant**
	(a)	be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;	Approval letter from DPE dated 2 August 2017.	Auditors for this audit were accepted and approved by DPE as: Michael Woolley – Lead Auditor; and Annabelle Tunggl Reyes – Auditor.	Compliant		While not sighted by Cardno, the Independent Auditor sighted a letter of approval from DPE dated 2 August 2017	Compliant
	(b)	include consultation with the relevant agencies;	Records of consultation to be provided by MCW	Consultation with agencies was conducted by Michael Woolley; Lead Auditor. Evidence of consultation is provided in the main report.			The Independent Auditor completed consutlation with the relevant agencies, as discussed in Section 3 of the audit report.	
	(c)	assess the environmental performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL (including any plan or program required under these approvals);		Environmental performance of the project is assessed in this checklist and in the main body of the report. Compliance with the EPL is assessed in a separate Checklist.			The main body of the audit and Appendix A assessed compliance with the Project Approval, while Appendix B assessed compliance with the EPL.	
	(d)	review the adequacy of any plans or programs required under these approvals; and, if appropriate; a		Refer to the Audit Report Section 4. Review of Environmental Management Plans for details			Section 7 of the audit report reviewed the adequacy of the plans and programs associated with the Project Approval.	
	(e)	recommend measures or actions to improve the environmental performance of the Project, and/or any plan or program required under these approvals; and		Recommendations are provided throughout this checklist and the main report. Section 6 of the main report includes a summary of recommendations.			Section 8 of the audit report provided recommendations and a summary of non-compliances.	
	(f)	be placed on Council's website within 2 weeks of its completion.		Noted. This is the responsibility of WCC once the audit report is finalised.	Note		The final version of the audit report has been added to the WCC website.	
	10	Within 6 weeks of the completing of this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.		Noted	Note		A copy of the audit report together with WCC response to recommendations was submitted on 20 April 2018 to DPE.	Compliant
Access to information	11	From the commencement of construction of the project, the Proponent shall make the following information publicly available on its (Council's) website as it is progressively required by the approval:						
	(a)	a copy of all current statutory approvals;	DPE Website http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4024 EPA website http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&	Link in WCC website is available to the statutory approvals.	Compliant	Council Website - http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	A link is available on the WCC website to the statutory approvals, located on the DPE Website and EPA Website.	Compliant
	(b)	a copy of the current plans and programs required under this approval;	LEMP 2014 CEMPF 2013	The LEMP and CEMPF were not posted on the WCC website at the time of the site inspections and hence WCC are considered as non compliant with this condition. As of 26 February, the documents were sighted on the website.	**Non-compliant**		The LEMP and CEMPF have been uploaded to the WCC Website.	Compliant

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Schedule 5 - Environmental Management, Reporting and Auditing			MCW Environmental Consulting Pty Ltd, March 2018			Cardno, December 2018		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Finding**	**Compliance Status & Recommendation**
	(c)	a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.Aspx	Monitoring results were sighted on and downloaded from the WCC website.	Compliant		Monitoring results have been uploaded to the WCC Website	Compliant
	(d)	a complaints register, which is to be updated on a monthly basis;	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.Aspx	All complaints are logged into Councils Customer Request Management System 'Pathways'. Complaints are reported to the community via the annual returns which are published on our website. WCC do not have a register of all complaints posted on the WCC website as required of the Condition. WCC have a complaints form in the LEMP, however, evidence of the use of this form was not provided by WCC and an Environmental Incident Report form was sighted for complaints. Recommendation: It is recommended that a register of complaints, updated monthly, is provided on the WCC website. OFI: Update the LEMP with the form being used by WCC for the recording of complaints.	Non-compliant		A Cusomter Complaints Register has been provided on the WCC website, and was last updated on September 2018.	Compliant
	(e)	a copy of the Annual Reviews (over the last 5 years);	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.Aspx	EPA Annual Returns were posted on the WCC website.	Compliant		EPA Annual Returns have been posted on the WCC website. Previous Annual Reviews completed under Schedule 5 Condition 5 have not been updated as this Annual Review is the first of its kind. This Annual Review will be uploaded within 2 weeks of completion, in accordance with Schedule 5 Condition 5 (f).	Compliant
	(f)	a copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit; and		This is the first IEA. This audit report will need to be posted on the WCC website when finalised.	Note		The Independent Environmental Audit 2018 has been uploaded to the WCC website, however WCC's responses to the recommendations have not been uploaded.	**Non-compliant**
	(g)	any other matter required by the Director-General.		Noted.	Note		Noted.	Noted.

WHYTES GULLY LANDFILL EXPANSION PROJECT - Minister's Condition of Approval 11_0094 MOD 1			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
PROJECT MODIFICATION 1 - Alteration of construction and operation hours			MCW Environmental Consulting Pty Ltd, March 2018			Cardno, December 2018		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Cardno comments**	**Compliance Status & Recommendation**
	4	Deleted Condition 2 and replace with the following:					Action completed, however omitted due to Modification 2.	Compliant
Schedule 3: Administrative Conditions								
Terms of approval	2	~~The Proponent shall carry out the project generally in accordance with the:~~		(Omitted due to Modification 2)			(Omitted due to Modification 2, discussed in Modification 2 table)	
	~~(a)~~	~~EA;~~						
	~~(b)~~	~~PPR;~~						
	~~(c)~~	~~Statement of Commitments (see Appendix 1);~~						
	~~(d)~~	~~site layout plans and drawings in the EA (see Appendix 2);~~						
	~~(e)~~	~~modification application MOD 1; and~~						
	~~(f)~~	~~conditions of this approval.~~						
	5	Delete table and replace with the following:						
Schedule 4 - Specific environmental conditions								
Operating hours	33	The Proponent shall comply with the construction and operating hours detailed in Table 7 for the site, unless otherwise agreed in writing by the Director-General. *Table 7: Construction and Operating Hours* **Activity / Day / Time** **Construction** – Monday to Friday – 7:00 AM to 6:00 PM Saturday – 8:00 AM to 4:00 PM Sunday and Public Holidays – Nil **Operation** – Monday to Friday – 7:30 AM to 4:30 PM Saturday, Sunday and Public Holidays – 8:00 AM to 4:00 PM **Other Operational Activities** – Monday to Friday – 7:00 AM to 6:00 PM Saturday, Sunday and Public Holidays – 8:00 AM to 4:00 PM	August 2017 Weighbridge hours 18 September 2017	Landfill operations as per the data provided (use of the weighbridge) were within the standard hours between 7:30 and 4:30. WCC confirmed that no works were conducted outside of standard working hours.	Compliant	LEMP Appendix M	WCC confirmed that no works were conducted outside of standard working hours. The Independent Auditor confirmed that landfill operations were within the standard hours. WCC noted that the new hours were requested to cover the installation of the liner under construction, however this work did not commence during the reporting period.	Compliant
	6	Delete Condition 34 and replace with the following:					Action completed	Compliant
Noise management plan	34	The Proponent shall prepare and implement a **Noise Management Plan** for the project in consultation with the EPA and to the satisfaction of the Secretary. The plan must:	Section 3.4 of CEMPF Section 9.7 LEMP and Appendix M Noise Management Plan		Compliant	LEMP Section 9.7 and Appendix M Noise Management Plan; CEMPF Section 3.4	A Noise Management Plan has been prepared by Golder Associates, and was approved as part of the LEMP by DPE on 11 December 2014, and as part of the CEMPF on 20 August 2013. The Noise Management Plan is currently being updated to include the required modifications.	**Non-compliant**
	(a)	be prepared and implemented by a suitably qualified and experienced person whose appointment has been approved by the Secretary;		The plan was prepared by Golders.				
	(b)	be approved by the Secretary prior to the commencement of construction;		The plan was approved by DPE as part of the LEMP on 11/12/14.				
	(c)	describe the measures that will be implemented to minimise noise from the construction and operation of the project and ensure:		Measures are described in the plan. Refer to discussion for Condition 32.				
		• best management practice is employed on site;						
		• implementation of traffic noise management measures;						
		• the noise impacts of the project are minimised during adverse meteorological conditions; and						
		• compliance with the relevant conditions (including noise limits) of this approval.						
	(d)	describe the noise management system;		Described in the plan			Section 3.4.4 of the CEMPF provides the required compoenents according to this condition.	Compliant
	(e)	includes a noise monitoring program that:	East Cape Contractor Service Maintenance Records and noise monitoring ERTECH Premobilisation Checklist	Noise monitoring for construction activities were conducted and records of monitoring report were provided to auditor, however, the implementation of the Noise Management Plan (specifically for operations) was not reviewed during this audit. WCC did not provide evidence of "evaluating and reporting on the effectiveness of the noise management system" as required of the condition. OFI: It is recommended that WCC conducts a review of the implementation of the noise management plan for operations and construction to ensure compliance to this condition. OFI: WCC to address the requirement of the condition to "evaluate and report on the effectiveness of	**OFI**		A noise monitoring program is provided in Section 3.4.5 of the CEMPF. However, as noted by the Independent Auditor, evidence of the evaulation and reporting on the effectiveness of the noise management system was not provided, and the auditor recommended that a review of the implementation of the noise management plan for operations and construction is compelted to ensure compliance with this condition.	**OFI**
		• is capable of evaluating the performance of the project;						
		• includes a protocol for determining exceedances of the noise limits in this approval and responding to complaints;						
		• adequately supports the noise management system; and						
		• evaluates and reports on the effectiveness of the noise management system.						
	(f)	include a description of the remedial actions that may be implemented in the event of a non-compliance with the noise limits in this approval.	Section 9.7 of LEMP Section 3.4 of CEMPF	No non-compliance with the noise limits were identified. No complaints were recorded as having been received regarding noise.		LEMP Section 9.7 and Appendix M Noise Management Plan; CEMPF Section 3.4	Remedial actions for implementation in the even of a non-compliance is discussed in Section 3.4.6 of the Noise Management Plan (CEMPF). No non-compliance with the noise limits or complaints regarding noise have been identified to date.	Compliant
	(g)	be updated and resubmitted to the Secretary for approval within three months following the approval MOD 1. The CNMP shall be updated prior to the commencement of the conditions of any such approval; and		(Condition not assessed by Independent Auditor)			The Noise Management Plan is in the process of being updated by Golder Associates and is yet to be submitted to the Secretary for approval.	**Non-compliant**
	(h)	include management and mitigation measures developed in consultation with the sensitive receivers identified in Appendix 6.		(Condition not assessed by Independent Auditor)		LEMP Section 9.7 and Appendix M Noise Management Plan; CEMPF Section 3.4	The Noise Management Plan includes management and mitigation measures in Section 3.4.5, however states in Section 3.4.7 that negotiated agreements would be commenced prior to construction of the appropriate stage of the Project with the affected community. WCC have not advised that this consultation has occurred.	**Non-compliant**
		This plan must be documented in the CEMP and Landfill EMP (see Conditions 2 and 3 in Schedule 5).					The Noise Management Plan is included in both th CEMPF and LEMP	Compliant

WHYTES GULLY LANDFILL EXPANSION PROJECT - Minister's Condition of Approval 11_0094 MOD 2			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
Eastern Gully Landfill Waste Cutback to stormwater diversion			MCW Environmental Consulting Pty Ltd, March 2018			Cardno, December 2018		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Finding**	**Compliance Status & Recommendation**
	4	Deleted Condition 2 and replace with the following:					Action completed	Compliant
Schedule 3: Administrative Conditions								
Terms of approval	2	The Proponent shall carry out the project generally in accordance with the:						
	(a)	EA;		The requirements of the Environmental Assessment (EA) have been incorporated into the conditions of approval. This audit has focused on the review of compliance with the requirements of the Minister's Conditions of Approval. It was noted that the LEMP and CEMPF were developed as per the requirements of the EA. The requirements of the EA are also referenced in MCoA conditions which have been assessed within this checklist. While Auditors have conducted a high level review of the requirements of the EA, the audit did not comprise a detailed assessment against the EA. It is considered the project is "generally carried out in accordance with the EA" subject to the comments made throughout this checklist.	Compliant		The Statement of Commitments provided in the EA has been updated in the PPR, and the final Statement of Commitments is included in Appendix 1 to the Project Approval. The proposed works are generally in compliance with the Statement of Commitments.	Compliant
	(b)	PPR;		The requirements of the Preferred Project Report (PPR) have been incorporated in the conditions of approval. Refer to the following conditions for the assessment of this condition. While Auditors have conducted a high level review of the requirements of the PPR, the audit did not comprise a detailed assessment against the EA. It is considered the project is "generally carried out in accordance with the PPR" subject to the comments made throughout this checklist.	Compliant		The PPR included a revised draft Statement of Commitments, the final version of which has been included as Appendix 1 to the Project Approval. The proposed works are generally in compliance with the Statement of Commitments.	Compliant
	(c)	Statement of Commitments (see Appendix 1);		Refer to Appendix 1 of this checklist for the compliance status on the requirements of the Statement of Commitments. Overall it is considered the project is "generally carried out in accordance" with the Statement of Commitments other than identified otherwise in this checklist.	Compliant		Refer to "Statement of Commitments" tab. The proposed works are generally in compliance with the Statement of Commitments.	Compliant
	(d)	site layout plans and drawings in the EA (see Appendix 2);	Environmental Assessment Report	Based on the site layout in EA the extent of the landfill works only covers the following Lot and DP numbers: - Lot 1 DP240557 (it appears this should be Lot 2 DP240557) - Lot 501 DP1079122 - Lot 502 DP1079122 - Lot 53 DP1022266 The following lots are also covered under the MCoA and EPL premise map but these are not included in the scope of this audit and were reported by WCC to be not part of Whytes Gully Landfill Extension Project: - Lot 52 DP 1022266 is leased by Visy Recycling - Lot 51 DP 1022266 was noted not to be under Whytes Gully Landfill management. OFI: WCC should consider the compliance implications of the approval instrument 11_0094 covering areas not under the direct control of the landfill operations (Lot 52 DP 1022266 and Lot 51 DP 1022266) and under the control of other entities. The audit did not consider activities or operations on these Lots nor did it consider any related compliance implications.	**Compliant, OFI**		The Independent Auditor noted that Lot 52 DP 1022266 and Lot 51 DP 1022266 are not under the control of the landfill operations and are under the control of other entities, and the Independent Environmental Audit did not consider activities or operations on these lots, not did consider any related compliance implications. Modification 2 is variation to the original site layout, and this variation has been approved by DPE.	**Compliant, OFI**
	(e)	modification application MOD 1;		(Condition not assessed by Independent Auditor)			The proposed works are generally in compliance with MOD 1 conditions.	Compliant
	(f)	modification application MOD 2; and		(Condition not assessed by Independent Auditor)			The proposed works are generally in compliance with MOD 2 conditions.	Compliant
	(g)	conditions of this approval.		Refer to the following review of conditions. This audit focussed on the review of compliance to the conditions of approval and implementation of LEMP and CEMP.			Refer to the Project Approval (Schedules 3-5) assessment in Appendix A. The proposed works are generally in compliance with the project approvals.	Compliant
	5	Delete and replace Condition 18 as follows:					Action completed	Compliant
Schedule 4 - Specific environmental conditions								
Soil, water and leachate management plan	18	The Proponent shall prepare and implement a **Soil, Water and Leachate Management Plan** for the project in consultation with Council, NOW and the EPA and to the satisfaction of the Secretary. This plan must be prepared and implemented by a suitably qualified and experienced person and be approved by the Secretary prior to the commencement of operation. The plan must include:	Section 7.3 of LEMP defined the surface water and sediment controls.	Process to manage the soil, water and leachate is defined in Section 7.3 of LEMP with reference to future works as per detailed design report for ongoing Package 2 and 3 landfill cell. The LEMP was prepared by Golders and approved by DPE on 11/12/14. Implementation: Evidence of implementation was noted in the monitoring of groundwater, surface and leachate water. Maintenance of leachate pond and water treatment facility was also noted.	Compliant	LEMP Section 7.0 Water Quality Management	Chapter 7.0 of the LEMP was prepared in response to the original Schedule 4, condition 18 requirements. The LEMP was prepared by Golder Associates and approved by DPE on 11 December 2014. The LEMP is currently being updated to account for MOD 2 works. Evidence of implementation of soil, water and leachate management and maintenance of leachate pond and water treatment facility has been noted.	**Non-compliant**
	(a)	a site water balance that:	Section 3.2.6 of the LEMP Technical Memorandum dated March 2012: Leachate Generation and Water Balance Modelling	Details of the Site Water Balance is provided in Section 3.2.6 of the LEMP. This references to other sections of the LEMP for further details. A detailed assessment is provided in Technical Memorandum dated March 2012: Leachate Generation and Water Balance Modelling. Based on approval of the plan the condition has been assessed as compliant. Water use onsite is considered minimal and mainly comprises dust suppression and office use. Trade waste water is discharged to sewer as per the Sydney Water Trade waste agreement. The effluent is sampled / monitored prior to discharging to the sewer.	Compliant	LEMP Section 3.2.6, Appendix E	Details of the Site Water Balance has been provided in Appendix E of the LEMP (RIENCO Consulting, 2008), and summarised in Section 3.2.6 of the LEMP. The Independent Auditor also references a Technical Memorandum dated March 2012: Leachate Generation and Water Balance Modeling which also provides an updated assessment of Site Water Balance. Water use onsite is condiered minimal and mainly comprises dust suppression and office use. Trade waste water is discharded to sewer as part of the Sydney Water Trade Waste Agreement (14 August 2017), and effluent is monitored prior to discharge to the sewer network.	Compliant
		• identifies the source of all water collected or stored on site, including rainfall, stormwater and groundwater;						
		• includes details of all water use on site and any discharges; and						
		• describes the measures that will be implemented to minimise water use on site.						
	(b)	an erosion and sediment control plan that:	Section 7.2.3 of LEMP defined the surface water and sediment controls.	Erosion and sediment control is presented in Section 7.2.3 of the LEMP. Observations made during the site inspection included that: • the Sediment pond is being maintained and monitored. Exposed areas are spray grassed and covered. • no significant areas of erosion were observed in drainage lines • some areas of the bank in the vicinity of the outlet to the sediment basin were not stabilised. • near the new cell construction where drainage and creek lines had recently been affected and controls had not been re-instated (this issue was already covered in the WCC Public Works Site Surveillance to be addressed by the contractor). OFI: Ensure ERSED controls are replaced promptly after works near drainage lines and stabilise the bank of the sediment pond near the outlet end.	**Compliant, OFI**	LEMP Section 7.2.3	Section 7.2.3 of the LEMP provides management strategies for erosion control that are consisten with the requirements of the Blue Book (Volume 1 and Volume 2B). While not sighted by Cardno, the Independent Auditor noted during site inspections that erosion and sediment controls are generally well maintained and are effective. The bank of the sediment pond near the outlet and drainage line works were noted to require erosion and sedimentation controls.	**Compliant, OFI**
		• is consistent with the requirements in the latest version of the Blue Book Volume 1 and Volume 2B;						
		• identifies the activities on site that could cause soil erosion and generate sediment; and						
		• describes the measures that will be implemented to:						
		○ minimise soil erosion and the transport of sediment to downstream waters, including the location, function and capacity of any erosion and sediment control structures and maintain these structures over time;						
		○ ensure that any topsoil stockpiles on site are suitably managed to ensure that the topsoil in these stockpiles can be beneficially used in the proposed revegetation and rehabilitation of the site.						
	(c)	a leachate management plan that:	Section 7.2.4 of LEMP defined the control and management of leachate Western Gully Deep Leachate Drainage Completion Report, 17 August	Leachate collection system is in operation and maintained.	Compliant	LEMP Section 7.2.4, Appendix I	Section 7.2.4 of the LEMP defines the control and management of leachate, including and outline of how the Leachate Collection System operates and a Water Contamination Remediation Plan. Final design of the Leachate management and collection system is provided in Appendix I of the LEMP.	Compliant
		• includes final detailed design specifications of the leachate management and collection system on site;						
		• demonstrates how the requirements of Condition 17 of this Schedule have been addressed; and						
		• includes a remedial action plan should leachate escape the leachate containment system.						
	(d)	a stormwater management plan that:	LEMP Section 7.2.3	Surface water and sediment control management is defined in Section 7.2.3 of LEMP which demonstrated compliance.	Compliant	LEMP Section 7.2.2, 7.2.3, Appendix I	Section 7.2.3 of the LEMP provides surface water and sediment control management, while Section 7.2.2 outlines the stormwater management collection system operations. Final design of the stormwater management and collection system is provided in Appendix I of the LEMP.	Compliant
		• is consistent with the guidance in the latest version of the Blue Book Volume 1 and Volume 2B and Chapter E14 of Wollongong DCP 2009;						
		• includes final detailed design specifications for the stormwater management and collection system;						
		• demonstrates how the requirements of Condition 15 of this Schedule has been addressed; and						
		• is updated to the satisfaction of the Secretary, prior to the construction of works associated with MOD 2, to ensure the stormwater design is in accordance with *Whytes Gully Resource Recovery Park - Eastern Gully Stormwater Report* prepared by Golder Associates, Report Number 1528284-054-R-Rev0, Dated September 2017.		(Condition not assessed by Independent Auditor)			The LEMP is in the process of being updated by Golder Associates and is yet to be submitted to the Secretary for approval.	**Non-compliant**
	(e)	an on-going surface water, groundwater and leachate monitoring program that includes (but is not limited to):	Section 7.3 of LEMP MONITORING LANDFILL SITES MASTER Whytes Gully analytical data Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	Section 7.3 of LEMP defined the monitoring of surface water, groundwater and leachate. Results of monitoring are recorded in a register provided to the auditors. Annual Return Report to EPA was provided as evidence. This provides a summary of water quality monitoring data and interpretation of results. The following monitoring and reporting was conducted by WCC. • Whytes Gully Groundwater Monitoring -Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring -Conducted annually in August, and after any overflow event caused by rain. WCC did not provide evidence that results of monitoring are reported to NOW and other relevant government agencies every 12 months, hence compliance with this aspect of the condition could not be verified. Recommendation: Provide results of monitoring to NOW (or equivalent agency) and other relevant government agencies every 12 months as required of the condition. The Plan is documented in the LEMP; Section 7.3. The auditors have relied on the approval of the plan by DPE to determine compliance with this condition and have not undertaken an assessment of the adequacy of the Soil, Water and Leachate Management Plan.	**Not Verified**	LEMP Section 7 and Appendix K Annual Report 2017-2018	Section 7 outlines the monitoring of surface water, groundwater and leachate. The implementation of this monitoring is confrirmed by analytical data and the Annual Report to EPA. It should be noted that the monitoring requirements have deviated from the content outlined in the LEMP in favour of EPL monitoring requirements. EPL monitoring requirements are considered more relevant due to EPA requirements for surface water, groundwater and leachate management.	Compliant
		• baseline data;					Appendix K Baseline Data Assessment Report provides baseline data for surface water, leachate and groundwater investigations.	
		• a combined surface and groundwater monitoring program to gain an understanding of surface and groundwater interaction and the potential for any impacts of the project on the downstream environment including GDEs and Dapto Creek;					Both surface water and groundwater monitoring is ongoing, and includes consideration of surface water and groundwater interactions, with locations upstream and downstream of the site.	
		• surface and groundwater impact assessment criteria including trigger levels for investigating adverse impacts;					Performance indicators are provided in Section 7 of the LEMP. In addition, surface and groundwater impact assessment criteria are assessed according to EPL performance criteria.	
		• a Mitigation Plan detailing the remedial actions to be implemented address potential impacts on the downstream environment from surface or groundwater contamination associated with the project and/or in the event of exceedances of the surface and/or groundwater impact assessment criteria; and					Section 7.5 of the LEMP contains a Water Contamination Remediation Plan. To date, no remediation has been required.	
		• a commitment to provide the results of monitoring to NOW and other relevant government agencies every 12 months.					Annual Reporting and Returns completed and provided to EPA annually. However, as noted by the Independent Auditor, there is currently no evidence that monitoring results are provided to NOW and other relevant government agenciesevery 12 months.	**Non-compliant**

WHYTES GULLY LANDFILL EXPANSION PROJECT - Minister's Condition of Approval 11_0094 MOD 2			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
Eastern Gully Landfill Waste Cutback to stormwater diversion			MCW Environmental Consulting Pty Ltd, March 2018			Cardno, December 2018		
Issue	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Comments / Finding**	**Compliance Status & Recommendation**
		This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).					Soil, Water and Leachate Management Plan is included in LEMP (Section 7).	Compliant
	6	Delete and replace Condition 49 as follows:					Action completed	Compliant
Schedule 4 - Specific environmental conditions								
Vegetation and biodiversity management	49	The Proponent shall prepare and implement a **Vegetation Management Plan** for the project to the satisfaction of the Secretary. This plan must:	CEMP Appendix C Vegetation Management Plan 2013 Updated Vegetation Management Plan July 2017 LEMP Section 11 Vegetation and Biodiversity Management Appendix O of the LEMP		Preparation: Compliant	LEMP Section 11 Vegetation and Biodiversity Management, LEMP Appendix O, CEMPF Appendix C Vegetation and Biodiversity Management Plan	A Vegetation Management Plan was initially prepared as part of the LEMP (Appendix O) and CEMPF (Appendix C) in August 2013. This plan has been updated by Biosis to address the requirements of Modification 2. The updated Vegetation Management Plan is dated July 2017, however has not yet been sighted by Cardno. As detailed by the Independent Auditor, the implementation of the Vegetation Management Plan was considered to be Non-Compliant based on issues related to weeds identified in Condition 45, and outcomes of the Biosis report (2017) report which outlines that more stringent weed action is required. It was recommended that WCC implement weed controls as defined in the Vegetation Management Plan.	**Non-compliant**
	(a)	be prepared by a suitably qualified and experienced expert;		Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013).	**Implementation: Non-compliant**		Biosis Pty Ltd was commissioned by WCC to prepare the initial Vegetation Management Plan in August 2013, and completed the review of the plan in July 2017.	Compliant
	(b)	be updated and approved by the Secretary within six months of determination of MOD 2 or prior to the commencement of construction, whichever is sooner;		The initial Vegetation Management Plan was included in the LEMP which was approved by DPE on 11/12/14.			The initial Vegetation Management Plan was included in the LEMP which was approved by DPE on 11/12/14. However, there is no evidence of the updated Vegetation Management Plan being submitted to the Secretary.	**Non-compliant**
	(c)	include a vegetation clearing protocol (see Condition 50 of this Schedule);		The plan included a vegetation clearing protocol.			Section 3.1 includes a vegetation clearing protocol.	Compliant
	(d)	must specifically include a Biodiversity Offset Strategy that:		Section 4.2 of the Biosis Vegetation Management Plan includes an assessment against the OEH principles. It is assumed that the approach to offsets was adequate as the plan was part of the LEMP approved by DPE. Auditors have not conducted an assessment of the plan against the Principles. In addition, the Vegetation Management Plan describes the following: The recommended management actions have been adjusted according to Councils requirement for each Management Zone to meet the condition targets to date outlined in the VMP (Biosis 2013). Specifically, the management actions outlined in this report align with a more intensive weed control program to achieve the condition targets within a 12 month period. (See discussion and OFI for Condition 45). Regeneration works are to be prioritised in the areas of vegetation in best condition; Management Zones 2 and 3 specifically, as these zones contain highest condition native vegetation remnants, including Illawarra Subtropical Rainforest EEC in Management Zone 2 and Illawarra Lowlands Grassy Woodland in Management Zone 3. Revegetation of Management Zones 5a and 5b should be undertaken using the plants provided in the recommended species lists provided in the VMP (Appendix 1, Biosis 2013). The management actions for each Management Zone are outlined in Table 3 of the document. Refer to Appendix 3 for the proposed timeline for the recommended scope of works to achieve the performance criteria outlined in Table 3 of the VMP 2017. This audit did not include a detailed assessment of the implementation of the Biodiversity Offset Strategy. Based on the issues related to weeds identified above in Condition 45; and outcomes of the Biosis report where more stringent weed actions are defined to be required, WCC are considered to be Non Compliant with the implementation of the weed controls measures identified in the Vegetation Management Plan. Recommendation: It is recommended WCC implement weed controls as defined in the Vegetation Management Plan. Recommendation: That WCC complete the implementation of the Vegetation Management Plan in full (in addition to weed management as defined above) and in regard to Offsets as detailed in the Vegetation Management Plan. Recommendation: Report progress in implementation of the VMP in Annual Environmental Reports.		Section 4 of the Vegetation Management Plan contains a Biodiversity Offset Assessment	Compliant
		• is assessed against the OEH's 'Principles for the Use of Biodiversity Offsets in NSW' and the 'Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, SSD and SSI Projects';					Section 4.2 provides offset calculations against the OEH principles. However, there is no reference to the 'Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, SSD and SSI Projects'. As stated by the Independent Auditor, it is assumed that the approach to offsets was adequate as the plan was part of the LEMP approved by DPE.	Compliant
		• details the proposed offset measures to be implemented and secured for removing and/or impacting 0.49 hectares of native vegetation (including 0.01 hectares of Illawarra Subtropical Rainforest) relating to project approval MP 11_0094 and 0.25 hectares of native vegetation (Illawarra Subtropical Rainforest) relating to MOD 2;					Section 4.2 outlines the proposed offset measures for the 0.49 hecatores of native vegetation. However, detailed offset measures for 0.25 hecatres of native vegetation relating to MOD 2 have not been detailed.	**Non-compliant**
		• identify conservation mechanisms to be used to ensure the long term protection and management of the offset sites;					Section 3.11 of the VMP outlines the long term management and protection of offset areas	Compliant
		• references best practice management guidelines for restoring and managing the vegetation communities proposed for protection;					Section 4.2 (Section 5 of Table 5) of the VMP ostates restoration works will follow the guideing principles set out in DEC (2005)	Compliant
		• details how the proposed offset measures will be protected, managed, funded and monitored over the life of the project;					Section 3.11 of the VMP outlines the long term management and protection of offset areas	Compliant
	(e)	ensure the project maintains suitable buffer distances to nearby waterways in accordance with Wollongong DCP 2009 to protect riparian land;		The project maintains suitable buffer distance to nearby waterways.			Section 3.2 of the VMP outlines that the unnamed drainage line that flows south from the Study Area has been significantly modified as a result of historic changes. Discussions with NOW (Biosis, 2012) confirmed that no riparian buffers have been proposed within the Study Area.	Not applicable
	(f)	incorporate the recommendations of the Whytes Gully landfill Modification: Flora and Fauna Assessment, prepared by Biosis, project number 20115, dated 11 October 2017; and		(Condition not assessed by Independent Auditor)			The initial Vegetation Management Plan did not include these recommendations, however the plan is currently being updated to incorporate.	**Non-compliant**
	(g)	details the site-wide ecological management and monitoring program/s to be implemented for the life of the project.		In 2017, WCC required an updated assessment of the current condition of the vegetation within the study area and the maintenance required to meet the performance criteria to date as outlined in the VMP (Biosis 2013). Performance criteria 'to date' was based on the assumption that the proposed works program would currently be in year four, if the VMP had been implemented in 2014. A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outline in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12 month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works.			Table 3 outlines the vegetation management zones, objectives, actions and performance criteria for each of the zones. Broader ecological management and monitoring is adequately discussed in Section 3 of the VMP. While not sighted by Cardno, the Independent Auditor reviewed the report by Biosis 2017 whileh provided an updated assessment of the current condition fo vegetation in the study area. This report detailed the results of field investigations includeing vegetation condition assessments, and the provision of management recommendations. management actions proposed in the updated report were proposed to be undertaken within a 12 month period.	**Non-compliant**
		This plan must be documented in the Landfill EMP and CEMP (see Conditions 2 and 3 in Schedule 5).		Documented in CEMPF Appendix C Vegetation Management Plan 2013; LEMP Section 11 Vegetation and Biodiversity Management and Appendix M of the LEMP.			Documented in CEMPF Appendix C; LEMP Section 11 Vegetation and Biodiversity Management, and Appendix O of the LEMP.	Compliant

WHYTES GULLY LANDFILL EXPANSION PROJECT - Proponent's Statement of Commitments			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
Appendix 1 of Project Approval			MCW Environmental Consulting Pty Ltd, March 2018			Cardno, December 2018		
Issue	**No.**	**Commitment**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Cardno Comments**	**Compliance Status & Recommendation**
General	1	Wollongong City Council would implement the Project in accordance with the EA and conditions of approval as provided by the determining authority.	Documents referred to in this audit report.	Based on the findings of this audit WCC have generally implemented the project in accordance with the EA and conditions of approval, other than where Non Compliant and Not Verified conditions have been identified in this report.	Compliant	Documents referred to in Appendix A tables	WCC have generally implemented the project in accordance with the EA and conditions of approval, with the exception of the identified Non-Compliances and Not-Verified conditions.	Compliant
	2	Wollongong City Council commit to considering the Concept Site Masterplan for future planning of resource recovery activities on the Whytes Gully RRP site. This includes consideration of an appropriate footprint for future resource recovery activities and access requirements.	Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014)	WCC is committed by developing this strategy. This commitment is broader than the intent of this audit and has not been reviewed in full as part of this audit.	Compliant	LEMP Appendix F Masterplan Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014)	WCC is committed to meeting the objectives set out in the Masterplan included in Appendix F of the LEMP, and the Wollongong Waste and Resource Recovery Strategy 2022 Action Plan. This commitment is broader than the intent of the Annual Review and has not been reviewed in full as part of this review.	Compliant
	3	By 2014 Wollongong City Council's Waste Strategy commits Wollongong City Council to reviewing available alternative waste technologies as identified in Wollongong City Council's Waste Strategy.	Councillor Briefing Session conducted in March 2015	WCC had conducted Councillor Briefing Session in March 2015. This session included review of alternative waste technologies as identified in the Wollongong City Council's Waste Strategy. This commitment is broader than the intent of this audit and has not been reviewed in full as part of this audit.	Compliant	Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014)	Alternative waste technologies are discussed in Sections 1.1.3 and 1.1.4 of the Wollongong Waste and Resource Recovery Strategy 2022. While not reviewed by Cardno, the Independent Auditor noted that a Councillor Briefing Session in march 2015 reviewed alternative waste technologies as identified in the WCC's Waste Strategy. This commitment is broader than the intent of the Annual Review and has not been reviewed in full as part of this review.	Compliant
	4	If the Project is approved, it is proposed that Wollongong City Council would surrender existing development consents of relevance to the Project site. This does not include the existing development consent for the MRF, which is not affected by the Project.		Refer to Schedule 3; Condition 7.	**Non-compliant Refer to Schedule 3; Condition 7.**		Refer to Schedule 3, Condition 7.	Compliant
Waste Management Strategy	5	Wollongong City Council would implement the Project in accordance with the "Wollongong City Council Waste and Resource Recovery Strategy 2012 to 2022" as provided in Appendix B and future updates of this document as relevant to the Project.	Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014)	WCC indicated that ongoing construction and operations are based on this strategy.	Compliant	Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014)	WCC indicated that ongoing construction and operations are based on this strategy.	Compliant
	6	Detailed design of the Project would consider and address constraints and opportunities identified within the EA.	Detailed Design Report	Detailed Design Report noted constraints and opportunities within the EA.	Compliant	Detailed Design Report	The Detailed Design Report noted constraints and opportunities within the EA	Compliant
Environmental Management Plans	7	A Construction Environmental Management Plan would be prepared and implemented to guide environmental management and monitoring activities during construction. The CEMP would include specific environmental issue sub-plans to reduce potential impacts and in accordance with relevant commitments identified within the EA and within this table. A monitoring program shall be conducted throughout the construction period to monitor compliance with the CEMP.	CEMPF 2013	Prepared by Golder Associates in 2013. Refer to CEMPF under condition 2; Schedule 5.	Compliant	CEMPF 2013	Prepared by Golder Associates in 2013. Refer to CEMPF under condition 2; Schedule 5.	Compliant
	8	The Landfill Environmental Management Plan (LEMP) would be implemented to be consistent with the draft LEMP provided in Appendix P. This includes implementation measures to guide environmental management and monitoring activities during operation as identified within the EA in addition to further specific issues identified within this Table.	LEMP 2014	Prepared by Golder Associates in 2014. Refer to LEMP under condition 3; Schedule 5.	Compliant	LEMP 2014	The LEMP was prepared by Golder Associates in 2014 and is consistent with the draft LEMP in Appendix P of the EA.	Compliant
Noise	9	All mobile equipment would be selected to minimise noise emissions. Equipment would be fitted with silencers and be in good working order.		Plant and equipment maintenance checklist and records provided.	Compliant		WCC confirmed that no noise suppression is currently used on plant at the site. While silencers are not specifically mentioned in the Project Approvals, a noise-related comment was raised at the Whytes Gully Reference Group Meeting minutes dated 22 November 2017 relating to the "pitch of the compactor and loaders reversing signals. WCC confirmed that this comment is being investigated and confirmation is yet to be received relating to the use of low frequency reversing alarms on all plant. While not signted by Cardno, the Independent Auditor confirmed that plant and equipment are adequately maintained according to checklists and records provided.	**Non-compliant, refer to Schedule 4, Condition 32**
	10	Broadband reversing alarms would be used for all site equipment.		Broadband reversing alarms were used as observed during audit inspection.	Compliant		WCC confirmed that no broadband reversing alarms are currently used on plant at the site.	**Non-compliant**
	11	Construction activities would be limited to the recommended construction hours where feasible and reasonable.		Construction works within standard working hours.	Compliant		Construction works are limited to the hours identified in Modifiation 1.	Compliant
	12	Consultation with residents who are identified as potentially affected by cumulative and operational noise exceedances and communication of details of the construction and operational program on a regular basis.		Not triggered.	Not triggered		This condition has not been triggered. However, WCC noted that residents are regularly invited to WCC meetings which are held every 3-6 months, and the community is consulted when works are about to commence or site activities change.	Compliant
	13	In accordance with Chapter 8 of the EPA "NSW Industrial Noise Policy" (2000), negotiated agreements would be commenced prior to construction of the appropriate stage of the Project with the affected community (i.e. Receiver N1 –Stage 3, Receiver N2 – Stage 2).		Not triggered.	Not triggered		The Submissions to the EA identified that the EPA advised that the negotiated agreements process in Chapter 8 of the NSW Industrial Noise Policy (2000) is applicable to receivers N1 and N2. The negotiated agreement process between the propopnent and the affected community are outlined in Section 8.3 of the INP, and could involve the negotiation of additional noise impact (eg extended times of operation, higher noise levels, defined time perior for annoying noise characteristics to operate, additional noise in less sensitivie parts of the day) in return for a package of benefits (eg less noise at sensitive times, treatment of residences, contributions to improve community facilities and infrastructure, or acquisition of residences). No agreements are currently known to be put in place. However, Stage 2 and 3 have not yet commenced.	Not triggered
	14	Provide a community liaison phone number and permanent site contact so that noise complaints would be received and addressed in a timely manner.		Provided in WCC website.	Compliant		Details provided on WCC website, front gate and on brochures. General contact number provided only.	Compliant
Greenhouse Gas	15	An active landfill gas management system would be installed including flaring and/or combustion to reduce potential greenhouse gas emissions from the landfill.		Flaring was conducted during audit inspection. Monitoring of gas manifolds was also conducted.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that flaring is conducted at the site.	Compliant
	16	Potential energy efficiency measures would be considered in the detailed design phase of the Project and be implemented and monitored through an Energy Savings Action Plan in accordance with the "Guidelines for Energy Savings Action Plans (DEUS 2005).		WCC indicated that OEH no longer require Energy Savings Action Plans and noted that in lieu of this, energy savings within Council are guided by their Draft Sustainable Buildings Strategy. Energy consumption is monitored on a continuous basis using a central monitoring system. Given that Energy Savings Action Plans are now no longer required, and given WCC have alternative approaches in place, this condition was considered Not Applicable.	NA		WCC indicated that OEH no longer require Energy Savings Action Plans and noted that in lieu of this, energy savings within Council are guided by their Draft Sustainable Buildings Strategy. Energy consumption is monitored on a continuous basis using a central monitoring system. Given that Energy Savings Action Plans are now no longer required, and given WCC have alternative approaches in place, this condition was considered Not Applicable.	Not applicable
Erosion and Sediment Control	17	An Erosion and Sedimentation Control Plan would be developed as part of the CEMP in general accordance with the following erosion and sedimentation control principles including:	CEMP 2013	Erosion and sedimentation control plans were provided for the construction works. Refer to Condition 21, Schedule 4 for discussion of Erosion and sediment controls and related OFIs.	Compliant	CEMPF Section 3.2 and 3.3	Section 3.3 of the CEMPF includes Erosion and Sedimentation control plans for construction works.	Compliant
	(a)	• Construction of earth bunds and diversion drains upslope and around the perimeter of construction areas where surface disturbance occurs, to prevent clean surface water entering these areas.		Observations were made of construction of earth bunds and diversion drains upslope and around the perimeter of construction areas.	Compliant		These mitigation measure have been listed in Section 3.3 of the CEMPF. While not observed by Cardno, the Independent Auditor confirmed that these mitigation measures had been implemented at the site.	Compliant
	(b)	• Erection of silt fences or straw bales at strategic locations (i.e. around stockpiles) to manage the migration of fines.		Silt fence were observed to be installed during audit inspection.	Compliant			
	(c)	• Construction of temporary sediment retention ponds.		Temporary sediment pond was constructed within the construction works area.	Compliant			
	(d)	• Dust suppression as needed.		Water cart was in operation for dust suppression.	Compliant			
	(e)	• Reducing the surface area disturbed by construction activities at any one time.		Generally, disturbed areas were sprayed grass.	Compliant			
	(f)	• Regular inspection and maintenance of sediment and erosion control structures.	Public Works Site Surveillance Inspection ERTECH Inspection records	Inspection checklist records were provided as evidence	Compliant			
	(g)	• Protecting and retaining vegetation and surface cover where possible.		Evidence at the site. Vegetation and surface covered retained.	Compliant			
	(h)	• Placement of an erosion protection barrier (e.g. grassing) at the completion of works.		Observed during audit inspection	Compliant			
	(i)	• Using designated access roads and paths where possible.		Designated access road were sealed.	Compliant			
	(j)	• Removing soil adhering to the wheels and undercarriage of trucks (e.g. by wheel wash) prior to departure from the Project site.		Rumble grid in used at the construction site.	Compliant			
	(k)	• Limit both the size of any stockpile footprints and the time between excavation and removal off-site of materials.		Stockpiles are sprayed grass.	Compliant			
	(l)	• Do not place stockpiles within 30 m of any watercourse.		Stockpile were placed uphill away from waterway.	Compliant			
	(m)	• Stabilise all disturbed areas as soon as practicable. Temporary vegetative destabilisation techniques must be applied to any disturbed soil to prevent areas remaining bare for more than 28 days.		Spray grass areas.	Compliant			
	(n)	• Stabilise all temporary and permanent drainage immediately.		Drainage lined with rock beaching and stabilised.	Compliant			
	(o)	• Maintain all sediments and erosion control measures in effective condition until the works are completed and the site is stabilised.		Controls are maintained and covered under the weekly inspection. See relevant discussion for the Conditions of Approval.	Compliant			
	(p)	• Release "Dirty" Stormwater, captured and stored by sediment and erosion control measures or site works, after treatment and testing to confirm compliance with relevant criteria.	Surface monitoring results.	Testing of surface water to meet EPL criteria is conducted prior to release to waterways.	Compliant			
	(q)	• A monitoring program shall be conducted by throughout the construction period to monitor compliance with the CEMP.		Public Works Surveillance Team conducts regular monitoring of the site controls with respect to construction.	Compliant		Section 3.2.4 outlines the monitoring program to be implemented during construction. While not observed by Cardno, the Independent Auditor confirmed that Public Works Surveillance Team conducts regular monitoring of the site constrols with respect to construction.	Compliant

WHYTES GULLY LANDFILL EXPANSION PROJECT - Proponent's Statement of Commitments			INDEPENDENT ENVIRONMENTAL AUDIT			ANNUAL REVIEW 2017-2018		
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Issue	**No.**	**Commitment**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Cardno Comments**	**Compliance Status & Recommendation**
	18	Proposed erosion and sediment control measures that would be applied during operation of the Project are outlined in the draft LEMP (Appendix P).	LEMP 2014 Section 7.2.3 Surface water and sediment controls	Erosion and sedimentation controls management is defined in LEMP and is implemented onsite e.g. swale with rock lining, use of rainflap, and stabilisation of exposed ground by spray grass. ERSED controls are discussed in detail in Condition 18.	Compliant	LEMP Section 7.2.3	Erosion and sedimentation controls management is defined in LEMP. While not observed by Cardno, the Independent Auditor confirmed that these controls were implemented onsite e.g. swale with rock lining, use of rainflap, and stabilisation of exposed ground by spray grass.	Compliant
Acid Sulfate Soils	19	In the event of discovery of Acid Sulfate Soils, procedures would be implemented/adopted to mitigate potential impacts on the environment in accordance with appropriate guidance and legislation and as identified in Chapter 12 of the EA.		WCC reported that no acid sulphate soil had been discovered.	Not Triggered	CEMPF Section 3.7.6	Framework CEMP includes management measures for Acid Sulfate Soils in Section 3.7.6. WCC reported that no acid sulphate soil has been discovered.	Not triggered
Contamination	20	In the event of discovery of previously unidentified area(s) of potentially contaminated material, procedures would be implemented/adopted to mitigate potential impacts on the environment, employees and the public in accordance with appropriate guidance and legislation and as identified in Chapter 12 of the EA.	CEMPF Section 3.7 Contamination Management Plan	Procedure in place defined in CEMPF Section 3.7. WCC reported that no unidentified areas of contamination had been identified. Auditors were not able to verify this based on documents provided. A procedure is in place for unexpected finds of asbestos.	Not Triggered	CEMPF Section 3.7.3	Section 3.7.3 of the Framework CEMP includes management measures in the event of identification of potentially contaminated materials. WCC reported that no unidentified areas of contamination have been identified.	Not triggered
Surface Water	21	A Surface Water Management Plan would be developed as part of the CEMP in general accordance with the following control principles:	ERTECH CEMP	Erosion and Sediment Control Plans and surface water management plan were included in ERTECH WHSE CEMP. This was not assessed by the auditors. See response to condition 2 Schedule 5.	Compliant	CEMPF Section 3.3	This mitigation measure has been listed in Section 3.3 of the CEMPF. While not signted by Cardno, the Independent Auditor confirmed that these control principles were also included in ERTECH WHSE CEMP. Refer to response in Schedule 5 Condition 2.	Compliant
	(a)	• Bund fuels, oils, paints, and other chemicals onsite to comply with the requirements of relevant legislation.						
	(b)	• Bunds must be fitted with an impervious floor and must not be fitted with a drain valve.						
	(c)	• Remove accidental spills of soil or other materials.						
	(d)	Wollongong City Council would commit to the following key principles in developing the surface water management controls for operation of the Project.	LEMP Appendix E WGL Surface Water and Leachate Management Plan	Surface water management controls for operation were developed as part of the LEMP. Surface water management discussed in response to Condition 18 Schedule 4.	Compliant	LEMP Appendix E WGL Surface Water and Leachate Management Plan	Surface water management controls for operation were developed in Appendix E of the LEMP for operation. Refer to response to Schedule 4 Condition 18.	Compliant
	(e)	• Diversion of clean drainage directly into Dapto Creek. Runoff from areas that are unaffected by the development would be allowed to discharge directly from the site to Dapto Creek.						
	(f)	• Runoff from areas that are likely to generate sediment such as the new cell construction areas and stockpile areas would be directed into the Surface Water Ponds.						
	(g)	• Reduce the volume of runoff to Surface Water Ponds by reducing the contributing catchment area at any particular time.						
	(h)	• Keep sources of different water quality types separate from each other.						
	(i)	• Construction of a perimeter bund around the entire active landfill area to prevent surface water from entering the landfill area.						
	(j)	• Construction of a diversion drain around the entire landfill area to collect all runoff from disturbed areas (but outside exposed/uncapped active waste cell area(s)) which would drain to the sedimentation basin						
	(k)	• The existing surface water ponds would be used for Stage 1 to 3 of the development.						
	(l)	• The Surface Water ponds would be downsized for Stage 4 onwards, as Stage 1 to 3 would be rehabilitated and runoff would be directed offsite to Dapto Creek.						
	(m)	• Re-use 'dirty' water for dust suppression.						
Groundwater	22	A Construction Quality Assurance (CQA) system would be implemented for cell construction. Detailed CQA requirements are embedded in the Technical Specification of the Design Report (Appendix 0).	Construction Completion Report for Cell 1A and 1B	Certification of implementation of QAQC system was included in Construction Reports. Refer to response to Condition 13; Schedule 4.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that certification of implement of QAQC system was indluced in the Construction Reports. Refer to reponse to Schedule 4 Condition 13.	Compliant
	23	During the operational phase of the Project a number of engineering measures and management strategies would be used to mitigate impacts to groundwater. Further documented within the EA these include:	LEMP Appendix E WGL Surface Water and Leachate Management Plan 2008 WGL Leachate Management Study 2002	WCC operates and implement the following controls: • Leachate Barrier System and Leachate Collection System • Leachate Pond • Leachate Treatment Plant • Groundwater separation The following monitoring and reporting was conducted by WCC. • Whytes Gully Groundwater Monitoring -Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring -Conducted annually in August, and after any overflow event caused by rain Refer to comments and findings for Condition 18 Schedule 4.	Compliant	LEMP Appendix E WGL Surface Water and Leachate Management Plan 2008 WGL Leachate Management Study 2002	WCC operates and implement the following controls: • Leachate Barrier System and Leachate Collection System • Leachate Pond • Leachate Treatment Plant • Groundwater separation The following monitoring and reporting was conducted by WCC. • Whytes Gully Groundwater Monitoring - Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring -Conducted annually in August, and after any overflow event caused by rain. Refer to comments and findings for Schedule 4 Condition 18.	Compliant
	(a)	• Leachate Barrier System and Leachate Collection System						
	(b)	• Leachate Pond						
	(c)	• Leachate Treatment Plant						
	(d)	• Groundwater separation						
	(e)	• Monitoring:						
	i	○ A network of groundwater bores would be used to monitoring groundwater quality and trends at the Project Site. This would include a regular programme of groundwater sampling and assessment as detailed in the LEMP.						
	ii	○ The leachate management system would be monitored in accordance with measures described in the LEMP including direct monitoring for the purposes of system integrity, leachate quantity and quality.						
	iii	○ Groundwater Assessment Program to monitor background concentrations. If a significant change in concentration for any of the indicator parameters is detected over two consecutive monitoring periods, then the affected groundwater monitoring bores would be resampled and assessed and OEH notified (if required). Following this a groundwater remediation plan may be developed in accordance with the LEMP.						
	iv	○ Combined surface water and groundwater monitoring program to gain an understanding of surface water and groundwater interaction and to assess potential impacts on the downstream environment including Dapto Creek and GDEs						
Leachate Management	24	Segregation of leachate from surface water and groundwater;	LEMP Appendix E WGL Surface Water and Leachate Management Plan	WCC implements segregation of leachate from surface and groundwater through the installation of rain flaps, drainage system and capping layer. Refer to Conditions 17 and 18; Schedule 4 for discussion of Leachate Management.	Compliant	LEMP Appendix E WGL Surface Water and Leachate Management Plan	WCC implements segregation of leachate from surface and groundwater through the installation of rain flaps, drainage system and capping layer. Refer to Schedule 4, Conditions 17 and 18 for discussion of Leachate Management.	Compliant
	25	Maintain pond levels with adequate freeboard to minimise the potential for overflow:						
	26	Continue to monitor leachate discharge to sewer in accordance with Trade Waste Agreement.						
Flora and Fauna	27	Clearing for the purposes of bushfire protection would be restricted to non- native vegetation communities (Acacia Scrub/Exotic, Closed Exotic Grassland, Planted). In accordance with the Bushfire Assessment, clearing or trimming of the Illawarra Subtropical Rainforest on the site is proposed to be avoided.	LEMP Appendix O Vegetation and Biodiversity Management Plan Whytes Gully New Landfill Cell – Terrestrial and Aquatic Flora and Fauna Assessment (May 2013)	These commitments are included in the vegetation and biodiversity management plan.	Compliant	CEMPF Appendix C, LEMP Appendix O Vegetation and Biodiversity Management Plan (May 2013)	The VMP states that clearing of vegetation will be restricted to non-native vegetation communities.	Compliant
	28	Removal of native vegetation communities and fauna habitats during construction and operation of the Project be avoided and minimised where possible.		Documented in the Biosis Report July 2017			The VMP specifies the breeding times for key species in Section 2.1.4	
	29	Undertaking two additional targeted surveys for the Green and Golden Bell Frog in the peak breeding season to confirm results of targeted surveys undertaken in November/December 2011 and early January 2012.		WCC provided a Whytes Gully New Landfill Cell – Terrestrial and Aquatic Flora and Fauna Assessment (May 2013). A flora and fauna assessment has been conducted for the Study Area in regard to the proposed Whytes Gully New Landfill Cell. This assessment has recorded one EEC and two threatened fauna species within the Study Area and has concluded an additional seven fauna species were considered likely to occur within the Study Area and may potentially be impacted by The Project. Targeted surveys for the GGBF and APS did not record these species and they were subsequently deemed a low likelihood of occurrence. Assessments of Significance for these EEC and species have concluded that, providing recommended avoidance and mitigation measures are adhered to, The Project is unlikely to have a significant impact on the threatened species or the EEC assessed."			WCC provided a Whytes Gully New Landfill Cell – Terrestrial and Aquatic Flora and Fauna Assessment (May 2013). A flora and fauna assessment has been conducted for the Study Area in regard to the proposed Whytes Gully New Landfill Cell. This assessment recorded one EEC and two threatened fauna species within the Study Area and concluded an additional seven fauna species were considered likely to occur within the Study Area and may potentially be impacted by The Project. Targeted surveys for the GGBF and APS did not record these species and they were subsequently deemed a low likelihood of occurrence. Assessments of Significance for these EEC and species have concluded that, providing recommended avoidance and mitigation measures are adhered to, The Project is unlikely to have a significant impact on the threatened species or the EEC assessed.	
	30	Waterbody removal and associated vegetation removal being undertaken over the spring or summer months when fauna species are most active.		Documented in Biosis Report July 2017			Mitigation measures included in Appendix C of the CEMPF	
	31	Undertaking protection of all retained trees. Tree protection measures such as temporary fencing will be implemented for any trees potentially indirectly impacted by the Project.		Documented in Biosis Report July 2017			Mitigation measures included in Appendix C of the CEMPF	
	32	Installation of protective fencing around all retained native vegetation. This is particularly important for areas of ISTR EEC where there is a risk of indirect impact.		Documented in Biosis Report July 2017			Mitigation measures included in Appendix C of the CEMPF	
	33	Installation of sediment and erosion controls as required including for potential indirect impacts to the ISTR EEC.		Erosion and sediment controls implemented as required. These are discussed in Condition 18: Schedule 4.			The Independent Auditor confirmed that erosion and sediment controls have been implemented as required. These are discussed in Schedule 4 Condition 18.	
	34	Ensure machinery parking, equipment or materials storage compounds, temporary stockpiling of excavated material and work areas are outside sensitive natural features including retained native vegetation, wetlands and drainage lines.		Compliant as per observation during audit inspection.			The Independent Auditor confirmed that site activities were compliant as per observation during audit inspection.	
	35	Logs removed with any vegetation removal would be relocated into areas of retained vegetation, for the purpose of providing fauna habitat.		Documented in Biosis Report July 2017			Mitigation measures included in Appendix C of the CEMPF	
	36	A weed control program would be undertaken in accordance with the LEMP.		Documented in Biosis Report July 2017. See recommendations made in relation to weed management in response to Condition 45; Schedule 4.			VMP outlines primary weed removal, secondary/follow up weed control, maintenance weeding, and control of noxious weeds. Refer to Schedule 4 Condition 45 for updated recommendations relating to weed management, as identified by the Independent Auditor.	
	37	Undertake revegetation of cleared and disturbed areas using a range of native species of local provenance for the purpose of managing weeds, controlling soil erosion, and maintaining fauna habitat in accordance with the Landscape Strategy (Appendix N).		Documented in Biosis Report July 2017			Mitigation measures included in Appendix C of the CEMPF	
	38	Maintain suitable buffer distances from nearby waterways. These buffer distances are recommended based on the stream orders of waterways and the subsequent categories identified within the "Wollongong City Council Development Control Plan 2009".		Documented in Biosis Report July 2017			Section 3.2 of the VMP outlines that the unnamed drainage line that flows south from the Study Area has been significantly modified as a result of historic changes. Discussions with NOW (Biosis, 2012) coonfirmed that no riparian buffers are required within the Study Area. Mitigation measures included in Appendix C of the CEMPF	
	39	Following the disturbance of existing surface water ponds, landscaping would be undertaken to enhance existing riparian zone vegetation associated at the ponds to be in accordance with appropriate riparian buffer widths. The vegetation buffer is proposed to be constructed to an average width of 5 metres where possible to improve the existing aquatic habitats.		Documented in Biosis Report July 2017			Mitigation measures included in Appendix C of the CEMPF	

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Issue	**No.**	**Commitment**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**	**Evidence Source**	**Cardno Comments**	**Compliance Status & Recommendation**
	40	Extend the current water quality monitoring program to include one monitoring location on Dapto Creek, upstream of the discharge point and two locations downstream.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data Annual Report to EPA	Sampling locations on Dapto Creek is implemented.	Compliant	Annual Report 2017/2018	Sampling locations on Dapto Creek implemented as part of EPL compliance (sampling locations 1, 33 and 34).	Compliant
	41	Biodiversity and habitat values would be maintained and increased where possible by planting a range of indigenous species.	LEMP Appendix O Vegetation and Biodiversity Management Plan	Documented in Vegetation Management Plan.	Complaint	LEMP Appendix O Vegetation and Biodiversity Management Plan	Document in Appendix O of the LEMP Vegetation and Biodiversity Management Plan.	Compliant
	42	Offsetting measures, and measures to monitor the success of these offsets, would be outlined in a Vegetation Management Plan.						
Air Quality	43	Watering of unsealed haul roads and disturbed surfaces (including construction areas).	Documented in LEMP 8.0 Air Quality Management Site inspection Plant Daily Inspection Matrix Whytes Gully SOP Placement & Compaction of waste Whytes Gully Air Monitoring - Conducted monthly.	The following dust management practices were observed on site: • Water cart was observed during inspection. • Exposed area is restricted. Evident during site inspection. • Disturb areas is sprayed grass and will be landscape. • Air monitoring is conducted. • Odouriser was in operation during site audit. • Small tip face to restrict cover material. • Spray grass of Cell 1A. • Loads covered when leaving site. • No wheel washing. • Non-conformance was given to truck that track mud offsite. Other dust management measures are discussed on response to Condition 29; Schedule 4.	Compliant	Documented in LEMP 8.0 Air Quality Management	WCC and the Independent Auditor confirmed that the following are used on site: • Water cart was observed during inspection. • Exposed area is restricted. Evident during site inspection. • Disturb areas is hydromulched and will be landscape. • Air monitoring is conducted. • Odouriser was in operation during site audit. • Small tip face to restrict cover material. • Spray grass of Cell 1A. • Loads covered when leaving site. • No wheel washing. • Trucks clean-out area. • Regular inspections for dirt on roads. • Non-conformance was given to truck that track mud offsite. • Daily plant inspection. • Regular plant and equipment maintenance schedule. • Daily cover materials placed on activie landfill area at the end of each day. • Appropriate hours of construction and operation are adhered to. • Temporary shut down during windy conditions.	Compliant
	44	Restricting the size of disturbed areas as much as practicable.						
	45	Disturbed areas would be rehabilitation progressively in accordance with the Landscape Strategy.						
	46	Prevention of truck over-loading and covering dusty loads.						
	47	Washing down trucks before they leave the site.						
	48	Maintaining equipment and plant appropriately to ensure efficient operation.						
	49	The active landfill area would be covered following the completion of waste placement at the end of each day with landfill lids or approximately 150 mm of daily cover material or other cover system.						
	50	Adhering to appropriate hours of construction and operation.						
	51	Temporarily suspending operations under extreme wind speed conditions.						
	52	Giving consideration to reducing the footprint of the active cell area and daily cover and increasing the thickness of daily cover to control odour as required, particularly during the operation of Stage 1 during waste relocation works and Stage 4.						
	53	An air quality (including dust and odour) management strategy would be incorporated into the CEMP.						
	54	Monitoring in accordance with the EPL and ongoing assessment.						
Traffic and Transport	55	Appropriate management and maintenance of road pavement of Reddalls Road intersection to Whytes Gully RRP and site access.	LEMP Section 9.8 Traffic Control Princes Highway Reddalls Road Intersection Upgrade design Stage 2 Traffic Management Plan	WCC had demonstrated commitment based on the evidences presented i.e. development of traffic controls in LEMP, CEMP Traffic Management Plan, and upgrade of Reddalls Road Intersection. RMS were consulted with respect to WCC operations as part of this IEA by the auditors and did not raise any issues.	Compliant	LEMP Section 9.8 Traffic Control, CEMPF Appendix A, CEMPF Section 4.1	WCC have demonstrated commitemtn based on the LEMP, CEMPF, and the upgrade of Reddalls Road Intersection. The Independent Auditor noted that RMS was consulted as part of the IEA with respect to WCC operations and no issues were raised. WCC noted that they maintain the Reddalls Road at the entrance to the site, which includes maintenance of potholes and line marking.	Compliant
	56	The CEMP for the Project would include a traffic management plan identifying truck movements to and from the site, internal access, interactions with general public, parking and access requirements for construction personnel and safety signage and training of personnel in traffic management in accordance with relevant requirements and guidelines of the RTA in terms of road safety and network efficiency.						
	57	Where possible, trucks to the site would be scheduled to avoid peak hour and within standard hours of operation, except in emergencies.						
Heritage	58	Registered Aboriginal parties identified within the EA would be informed about the management of Aboriginal cultural heritage sites within Whytes Gully RRP where they may be impacted upon by the Project.	LEMP Figure 7 Heritage	Location of heritage significant areas within WGRRP were identified in Figure 7 of LEMP. WCC noted that the heritage areas are out the current WGL footprint. Included in the induction package of ERTECH. Refer to response to Condition 47; Schedule 4.	Compliant	LEMP Figure 7 Heritage, CEMPF Appendix B Cultural Heritage Induction	Figure 7 of the LEMP identifies that heritage significant areas within WGRRP are outside the current WGL footprint, with the exception of one at the pond which has most likely been destroyed as part of previous works. Consultation with registered Aboriginal parties has not been required as part of the works, nor the need to salvage Aboriginal heritage items.	Not triggered
	59	Identified potential archaeological deposits within the Whytes Gully RRP site would be left in their identified location and not salvaged unless the Project cannot avoid impacting upon these sites. If salvage is required Wollongong City Council would consult with the relevant statutory bodies and provide an opportunity for collection of the cultural material from the site.						
	60	Monitoring of construction would be completed for the Project where in proximity to listed heritage items (i.e. Glengarry Cottage) to ensure there is no disturbance to heritage significance.					The Independent Auditor noted that the ERTECH CEMP included the Cultural Heritage Induction as previously part of the CEMPF (Appendix B). This induction includes reference to these conditions.	Compliant
	61	A heritage induction including indigenous and non-indigenous heritage is proposed to be incorporated within the general induction during construction of the Project.						
	62	Should indigenous or non-indigenous cultural material be identified during any works, construction and/or operation will cease in the vicinity of the find and the appropriate representative at OEH will be contacted.						
Visual	63	Staging and planning of landfill activities to reduce the extent to which they would be visible during the construction and operation of the Project.	LEMP Appendix L Landscape Strategy	Landscape strategy is documented in LEMP. Refer to Condition 40; Schedule 4.	Compliant	LEMP Appendix L Landscape Strategy	Appendix L of the LEMP documents the landscape strategy of the site.	Compliant
	64	Implementation of the Landscape Strategy (Appendix N of the EA) to reduce and manage potential long term visual impacts.					Revegetation activities have not been required to date.	Not triggered
	65	Reducing the area of un-vegetated landfill slope, both permanent and temporary, by staging the operations and progressively establishing a vegetation cover on each section of slope as they are completed.						
	66	Revegetating the proposed landfill slopes with mix of shrubs and small trees and grass to create a landscape character similar to adjoining rural areas.	Vegetation Management Plan	Documented in the LEMP.	Compliant	LEMP Appendix O Vegetation and Biodiversity Management Plan (May 2013)	This requirement is document in the LEMP Appendix O, however WCC notes that revegetation activities have not yet been required.	Not triggered
	67	Adopting design options (when suitable) to be in keeping with the surroundings of the site including native grasses and dark toned colours for existing and proposed structures to reduce their visual contrast with their landscape setting.	LEMP Appendix L Landscape Strategy	Landscape strategy is documented in the LEMP.	Compliant	LEMP Appendix L Landscape Strategy, LEMP Appendix O Vegetation and Biodiversity Management Plan (May 2013)	Revegetation will include loaclly native ground layer species (grasses) according to Table 3 of the VMP. Appendix L of the LEMP also included a landscape strategy that addressed this commitment.	Compliant
	68	Consulting with residents (as identified within the relevant chapter of the EA) to discuss the potential for planting to be carried out close to their houses to screen views of the landfill operations.		No planting close to residents.	Not triggered		Revegetation activities have not been required to date.	Not triggered
	69	Subject to bushfire protection requirements (such as trimming of mature trees), existing native vegetation would be retained where possible to provide visual screening and contribute to the landscape character of Whytes Gully RRP.	Updated Vegetation Management Plan	Documented in the LEMP.	Compliant	LEMP Appendix O Vegetation and Biodiversity Management Plan (May 2013)	The VMP includes requirements to retain native vegetation where possible.	Compliant
	70	Screen planting with dense tall tree planting on natural ground would be used to block views to the site, particularly from adjoining residences.	LEMP Appendix L Landscape Strategy	Landscape strategy is documented in the LEMP. Section 4 of the Landscape Strategy states that "the proposed planting along sections of the site boundary is intended to provide visual screening of the landfill operations from adjoining properties. In order to fulfil this function, the planting will need to be carried out in advance of landfill operations. A minimum of 5 years growth will be required to provide the intended visual screening. WCC did not provide evidence of where trees have been planted for screening purposes. Minutes of the Whytes Gully Reference Group meetings on 24 May and 22 November 2017 indicated questions from members as to why screening trees had not been planted at the boundary of the site. Recommendation: WCC to conduct screen planting with dense tall tree planting on natural ground to block views to the site, particularly from adjoining residences.	**Non-compliant**	LEMP Appendix L Landscape Strategy	Landscape strategy is documented in the LEMP. No revegetation has occurred to date, and there was no evidence that trees proposed for planting along section of the site boundary for visual screening had been planted, as noted by the Independent Auditor.	**Non-compliant**
Socio-economic	71	A Stakeholder Strategy would be implemented throughout the delivery of the Project. Provided within environmental management documentation (LEMP) the Stakeholder Strategy would provide procedures for communication with stakeholders, procedures for the dissemination of information to the community, identification of the communication channels available for the community and stakeholders to provide feedback on the Project, a protocol for the Project to respond to any enquires or feedback and for managing site visits and property inspections.	LEMP Appendix P	Appendix P of the LEMP provides for a community education program. WCC stated that the community website also provides a function to meet this condition. This did not appear to be a specific stakeholder strategy for the Landfill Operations.	Compliant	LEMP Appendix P	Appendix P of the LEMP provides for a community education program, and WCC stated that the community website also provides a function to meet this condition. There is not a specific stakeholder strategy prepared for the landfill operations.	Compliant
	72	Implementation of measures to reduce the potential for construction and operation impacts upon amenity as identified within the relevant chapters of the EA and the draft Statement of Commitments.				LEMP Section 9	Section 9 of the LEMP provides considerations for operation with regards to hazards and loss of amenity.	
Hazards and Risks	73	No smoking around plant equipment and within designated areas only.	Safety Management Plan SMP Induction TEMPLATE Checklist CURRENT June 2016 LEMP 2014 CEMPF 2013	Evidence of demonstration at the site was observed and included in the Safety Management Plan Induction Checklist for all visitors and employees. No smoking signs observed at the WGL compound andoffices. Spill bunding was available for plant and the hazardous materials sighted.	Compliant		While not sighted by Cardno, the Independent Auditor confirmed that evidence of these measures were observed and included in the Safety Management Plan Induction Checklist for all visitors and employees.	Compliant
	74	Any dangerous goods would be stored in accordance with normal dangerous goods storage procedures.						
	75	Spill containment to be managed in accordance with relevant Australian Standards.						
	76	Safety hazards would be managed through occupational health and safety procedures.						
	77	Environmental hazards would be managed through the CEMP and LEMP.						
	78	Fire protection (including fire extinguishers, separation distances) would be provided in accordance with relevant Australian Standards and as identified within the EA.	Flood Emergency and Evacuation Plan	Fire extinguishers and fire hydrants are available and maintained. The Auditors are not fire experts and an assessment of compliance with this commitment was not undertaken.	Compliant		While not sighted by Cardno, the Independent Auditor noted that fire extinguishers were available and serviced periodically, and water cards were always availabe on site.	Compliant
	79	Fire suppression and protection systems serviced and inspected periodically.		Fire extinguisher serviced periodically. The Auditors are not fire experts and an assessment of compliance with this commitment was not undertaken.				
	80	Water carts would continue to be made available at the site.		Water cart always available on site.				
	81	Site emergency response plan including emergency contact numbers provided within management system for the site.	LEMP Appendix A Emergency Response Procedures and Plan Pollution Incident Response Management Plan (PIRMP) V03, 2017	Emergency Response Plan and PIRMP are available and implemented. WCC had conducted emergency evacuation drill on January 2017.	Compliant	LEMP Appendix A Emergency Response Procedures and Plan Pollution Incident Response Management Plan (PIRMP) V03, 2017	Appendix A of the LEMP includes an Emergency Response Plan and PIRMP. The Independent Auditor confirmed that WCC had conducted an emergency evacuation drill on January 2017.	Compliant

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	82	The site landscaping would not exceed a fuel load of 2 t/ha.	Landscape Strategy	WCC implementation of Landscape Strategy. Site view at the top of the hill. WCC reported that they consider that the current landscape does not exceed a fuel load of 2 t/ha.	Compliant	LEMP Section 8.2.3, Appendix L Landscape Strategy	Requirement included in Section 8.2.3 of the LEMP. The Independent Auditor confirmed that these conditions have been implemented at the site.	Compliant
	83	Planted trees that are retained on the site would have the lower branches trimmed (cut off) to a height of 2 m above the ground. The tree trimming works may be staged with priority given to the protection of assets and fuel load reduction adjacent to roads.		Planted trees have lower branched trimmed. Not all areas were inspected to determine this.				
	84	An asset protection zone (APZ) of 10 m would be maintained around existing site buildings.		WCC stated that an asset protection zone of 10 m is maintained, however this was not verified b auditors.				
	85	A perimeter firebreak of 5 metres be established around the entire Whytes Gully RRP site and around buildings (roads and access tracks including offsite roads and tracks, may be utilised to form the fire break).		WCC stated that a perimeter firebreak of 5 metres is established around the WGRRP. This was fully verified by Auditors.				
	86	Wind-blown litter would be managed as outlined in the LEMP.	Extract from Trim (records management system) Community Service Attendance Records - Litter collection	Litter collection is conducted. Refer to Condition 9; Schedule 4 for discussion and OFIs.	Compliant		While not sighted by Cardno, the Independent Auditor sighted extract from TRIM and confirmed that litter collection is conducted.	Compliant
	87	Coordination of vegetation planting and removal with bushfire management requirements that include access tracks and fuel management zones.	LEMP Appendix O: Vegetation and Biodiversity Management Plan	Defined in Vegetation and Biodiversity Management Plan. Aspects relating to bushfire management were not assessed during the audit.	Compliant	LEMP Appendix O Vegetation and Biodiversity Management Plan	Defined in Vegetation and Biodiversity Management Plan. Vegetation planting has not occurred at the site to date, and aspects relating to bushfire management were not assessed by the Independent Auditor during their Independent Environmental Audit.	Compliant
	88	Flammable materials would be removed from site fencing as outlined in the LEMP.	LEMP Operating procedures	Defined in operating procedures. No flammable materials were observed on site fencing.	Compliant	LEMP Section 8.2.3	Requirements included in Section 8.2.3 of the LEMP. While not confirmed by Cardno, the Independent Auditor did not observe flamable materials on site	Compliant
	89	The LEMP would be implemented to ensure reduction of hazards and risk associated with delivery and/or processing of waste.		Comments on implementation of the LEMP are made throughout this document. A risk and hazard assessment was not conducted as part of this audit.	Compliant		Comments on implementation of the LEMP are made throughout this document. A risk and hazard assessment was not conducted as part of this audit.	
	90	A Vegetation Management Strategy (including Weed management) would be developed within the LEMP to ensure that vegetation is managed to not exceed recommended fuel loads in relevant guidelines.	LEMP Appendix O Vegetation and Biodiversity Management Plan	Developed and included in LEMP.	Compliant		In order to reduce fuel loads, planted trees will be managed so that the lower banches are trimmed to a height of 2m above the ground, and any tree would not be located within 10m from any building. This is outlined in Section 8.2.3 of the LEMP.	
	91	The general public would not be allowed direct access to the landfill.		No direct access to the landfill was observed during site inspections. Fencing around the WGRRP and security at the weigh bridge.	Compliant		While not confirmed by Cardno, the Independent Auditor observed that no direct access to the landfill was provided for the general public.	Compliant
	92	Security of the site would be maintained during construction and operation including security fencing, which is locked after hours of operation.	LEMP Section 9.2 Security of Site	Security is maintained at the construction site and operations. Construction areas are fenced. Access to landfill is only through the weighbridge. A camera is installed at the weighbridge.	Compliant	LEMP Section 9.2 Security of site	Requirement included in Section 9.2 of the LEMP. While not confirmed by Cardno, the Independent Auditor confirmed compliance with this commitment.	Compliant
	93	Waste entry and flows would be monitored and controlled in accordance with the LEMP.	LEMP Section 5 Gatehouse operation	Waste entry and flows was observed during site audit. Waste entry is through the weighbridge and signage are available to direct truck drivers where to go.	Compliant	LEMP Section 5 Gatehouse operation	Requirement included in Section 5 of the LEMP. While not confirmed by Cardno, the Independent Auditor confirmed compliance with this commitment.	Compliant
Rehabilitation and final landform	94	Development of a final landform that integrates with the surrounding landscape and environment.	LEMP Section 10 Site Closure	LEMP Section 10 Site Closure outlines the proposed approach for site and rehabilitation. Implementation of the LEMP and SOP for Placement and Compaction of waste was observed during the site audit. Final landform rehabilitation is yet to be implemented.	Compliant	LEMP Section 10 Site Closure	Capping of landfill has not yet occurred as part of this project. However, the Independent Auditor observed that measures for placement and compation of waste in accordance with LEMP Section 10 were being implemented at the site.	Not triggered
	95	Implementing of the Design Report to ensure that appropriate capping of the landfill is completed progressively throughout the Project.						
	96	Implementing the LEMP to ensure appropriate post closure monitoring and maintenance. This includes contingency and remediation measures should environmental monitoring indicate that the closed landfill is impacting upon air, surface water, groundwater or amenity of nearby receptors. This also includes procedures for maintaining the landfill surface post closure and repairing damage to the capping system.						
Stakeholder Engagement	97	Wollongong City Council commit to ongoing regular consultation with the community on the Project through:						
	(a)	• Community Consultative Committee for the Whytes Gully RRP.	http://www.wollongong.nsw.gov.au/council/haveyoursay/Pages/default.aspx http://www.wollongong.nsw.gov.au/council/meetings/Pages/default.aspx	WCC provided minutes of the Whytes Gully Reference Group for 22 November 2017; 24 May 2017; 23 November 2016; and 20 May 2015.	Compliant	http://www.wollongong.nsw.gov.au/council/haveyoursay/Pages/default.aspx http://www.wollongong.nsw.gov.au/council/meetings/Pages/default.aspx	WCC provided minutes of the Whytes Gully Reference Group for meetings held during the reporting period (22 November 2017) on their website.	Compliant
	(b)	• Phone line to communicate issues to Whytes Gully RRP management.	http://www.wollongong.nsw.gov.au/customerserviceonline/feedback/Pages/default.aspx	A general complaints line is available on the WCC website. This is not specific to the Whytes Gully RRP. Often for facilities such as landfills; a site specific complaints line is required. OFI: It is suggested WCC consider better advising of the complaints line to Council on Whytes Gully related web pages and other media, to make it more transparent how complaints to the facility can be made.	**Compliant OFI**	http://www.wollongong.nsw.gov.au/customerserviceonline/feedback/Pages/default.aspx	A general complaints line is available on the WCC website, however this is not specific to the Whytes Gully RRP. As recommeded by the Independent Auditor, more transparencey is required on the web pages and other media for complaints directly relating to the facility.	**Compliant OFI**
	(c)	• Complaints management process (as provided in the draft LEMP).	Extract from Pathways (one of records management system) - Air Pollution Complaints for Whytes Gully	WCC reported that all complaints/correspondence lodged with Council or via EPA are logged in databases Pathway and/or Trim.	Compliant	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	WCC reported that all complaints/correspondence lodged with Council or via EPA are logged in databases Pathway and/or Trim. A Customer Complaints Register is provided on the website.	Compliant
	(d)	• Clear signage at construction sites during construction.		Clear signage of construction site was observed. Construction area is fenced.	Compliant		While not observed by Cardno, the Indepenent Auditor confirmed that clear signage of construction site was present and the area was fenced.	Compliant
	(e)	• Stakeholder satisfaction surveys and feedback forms (as part of wider Wollongong City Council activity).	http://www.wollongong.nsw.gov.au/customerserviceonline/feedback/Pages/default.aspx	Available on the WCC website.	Compliant		Available on the WCC website.	Compliant
	(f)	• Ongoing use of interactive web-based activities including updates of the Project website.	http://www.wollongong.nsw.gov.au/services/majorprojects/Pages/WhytesGullyLandfillProject.aspx	WCC website available with project updates.	Compliant	http://www.wollongong.nsw.gov.au/services/majorprojects/Pages/WhytesGullyLandfillProject.aspx	WCC website available with project updates.	Compliant

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APPENDIX B

MANAGEMENT AND MONITORING REQUIREMENTS OF PLANS

LANDFILL ENVIRONMENTAL MANAGEMENT PLAN Regular actions to be completed on site			Report number: Date:	117625003_061_R_Rev2 Sep-14			
Section	**Topic**	**Actions for compliance**	**Inspection, monitoring and maintenance schedule**	**Frequency**	**Timing**	**2017/2018 Annual Review**	**Reference**
4.2	Training	Training for correct identification of excluded waste should be included in the training program				All staff have been appropriately trained via a TAFE waste management course.	Appendix A - Schedule 4 Condition 4
4.3	Complaints	Complaints register will be maintainted to log public complaitns regarding odour, vermin, litter, dust and noise. Date, time and nature of the complaint is recorded and subsequent action. Refer to Appendix G for compliants register form.				While not observed by Cardno, the Independent Auditor observed the complaints register. The complaints register is uploaded to WCC's website.	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.
4.3	Complaints	All staff will be trained in the requirement to notify and record any public complaint.				No evidence of compliance.	
5.2	Waste screening	Tip face waste screening to be undertaken by someone other than the compactor operator.				All staff have been appropriately trained via a TAFE waste management course. The daily inspection includes the completion of a tip face template.	Appendix A - Schedule 4 Condition 4
5.2	Waste screening		Random vehicle audits	Daily	Random	All staff have been appropriately trained via a TAFE waste management course. The daily inspection includes the completion of a small vehicle transfer station template.	Appendix A - Schedule 4 Condition 4
5.2	Waste screening		Screening of waste	Continuous	Continuous	All staff have been appropriately trained via a TAFE waste management course. Prior to entering the landfill, all trucks and cars pass through a weigh bridge, where a camera has been installed as an additional check for waste prior to entering the landfill. The daily inspection includes the completion of a tip face template and small vehicle transfer station template.	Appendix A - Schedule 4 Condition 4
5.2	Waste screening		Screen when truck tipping at tip face or tipping at Transfer Station	Continuous	Continuous	All staff have been appropriately trained via a TAFE waste management course. The daily inspection includes the completion of a tip face template and small vehicle transfer station template.	Appendix A - Schedule 4 Condition 4
5.3	Waste measurement and recording		Measurement of waste	Continuous	Continuous	The "Wasteman" program is used to track incoming/outgoing waste, and provides tonnage data that includes disposable and recyclable waste.	Appendix A - Schedule 3 Condition 5
5.3	Waste measurement and recording		Site survey	Twice per year	June, December	No evidence of compliance.	
5.3	Waste measurement and recording		Weighbridge certification	Once per year	December	No evidence of compliance.	
5.4	Recycling		Recording quantities of recovered materials	Continuous	Continuous	Tonnage data from the site records the quantities of incoming and outgoing recyclable materials at the site.	Appendix A - Schedule 4 Condition 5
5.4	Recycling		Assist customers with identifying oppourtnities for resource recovery	Continuous	Continuous	According to the Independent Auditor, flyers are provided to community on proper waste sorting prio to disposal to landfill and emphasis cost savings on disposing to landfill.	Appendix A - Schedule 4 Condition 3
5.4	Recycling		Monitor the cleanliness of the recoverables and recyclables drop off centre	Continuous	Continuous	No evidence of compliance.	Appendix A
5.5	Tyre management		Waste screening at tip face and waste transfer station	Continuous	Continuous	All staff have been appropriately trained via a TAFE waste management course. The daily inspection includes the completion of a tip face template and small vehicle transfer station template.	Appendix A - Schedule 4 Condition 4
5.6	Cleaning of vehicles	Clear signage indicating location and availability of high pressure water cleaner should be installed				No evidence of compliance.	
5.6	Cleaning of vehicles		Visual check of the site access road	Daily	End of day	This requirement is included in the daily inspection, and the Independent Auditor confirmed that no tracking of dirt or dust was noted on the road during their site inspection.	Appendix A - Schedule 4 Condition 25c
5.6	Cleaning of vehicles		Random audit of trucks leaving site	Weekly	End of week	No evidence of compliance.	
6.2	Tipping supervision	Council should provide a full-time supervior other than the compactor driver to supervise tipping				No evidence of compliance.	
6.2	Tipping supervision	A SOP should be developed for the Small Vehicles Transfer Station				No evidence of compliance.	
6.3	Filling plan / contours		Final filling plans/contours completed six months after each completed cell	As required	As required	No final filling/contouring was required during the reporting period.	
6.3	Filling plan / contours		Informal progress surveys	As required	As required	No final filling/contouring was required during the reporting period.	
6.3	Filling plan / contours		Six monthly survey	Six monthly	June, December	No final filling/contouring was required during the reporting period.	
6.4	Compaction of waste		Access waste compaction with compactor survey system	Ongoing	Ongoing	No evidence of compliance.	
6.4	Compaction of waste		Six monthly review of compaction data	Twice per year	June, December	No evidence of compliance.	
6.5	Covering of waste		Visual inspection of daily cover and landfill lids	Daily	End of day	This requirement is included in the daily inspection checklist which was sighted by the Independent Auditor.	Appendix A - Schedule 4 Condition 4
6.5	Covering of waste		Inspection after completion of land filling in each cell	As required	As required	No final filling/contouring was required during the reporting period.	
7.2.1	Leachate barrier system		Regular earthworks monitoring and testing during construction to ensure quality assurance	Detailed Design Report Appendix I	Detailed Design Report Appendix I	No evidence of compliance.	
7.2.2	Leachate collection system		Regular monitoring during construction to ensure Quality Assurance	Appendix I	Appendix I	No evidence of compliance.	
7.2.2	Leachate collection system		Inspection of leachate pump and pond operation	Weekly and daily during rainfall	End of week	No evidence of compliance.	
7.2.2	Leachate collection system		Preventative maintenance of Leachate pumps	Bi-annual with full overhaul every 3 years	End of week	No evidence of compliance.	
7.2.2	Leachate collection system		Inspection of leachate ponds including liner integrity	Quarterly	March, June, September, December	No evidence of compliance.	
7.2.2	Leachate collection system		Leachate disposal quantity (recorded from flowmeter)	Monthly	End of month	Monitoring of wastewater is undertaken every 22 days under the Trade Waste Agreement with Sydney Water (2017), and includes monitoring at the site's leachate treatment plant.	EPL Annual Report 2017-2018
7.2.2	Leachate collection system		Inspection of irrigation area prior to irrigation	Daily	Work days	No evidence of compliance.	
7.2.3	Surface water and sediment controls		Inspection of surface water reed beds and surface water polishing ponds	Quarterly and after rainfall events	March, June, September, December	No evidence of compliance.	
7.2.3	Surface water and sediment controls		Inspection of storm water diversion drains	Quarterly and after rainfall events	March, June, September, December	No evidence of compliance.	
7.2.3	Surface water and sediment controls	Separate "clean" and "dirty" stormwater collection systems and discharge "clean" stormwater off site				The Independent Auditor confirmed that various clean water diversion drains are in place at the site, includeing a rain flap to reduce stromwater entering the landfill area.	Appendix A - Schedule 4 Condtiion 15d
7.2.3	Surface water and sediment controls	Vegetate all drains				The Independent Auditor observed that drains have been lined with rock beaching and stabilised.	Statement of Commitments 17n
7.2.3	Surface water and sediment controls	Repair bare areas or areas showing surface erosion				The Independent Auditor observed that all disturbed areas had been spray grassed.	Statement of Commitments 17m
7.2.4	Control and management of leachate		Inspection of integrity of leachate ponds	Quarterly	March, June, September, December	No evidence of compliance.	
7.2.4	Control and management of leachate		Monitoring leachate pond levels and LTP operation	Daily	Daily	No evidence of compliance.	
7.2.4	Control and management of leachate		Maintenance of leachate management system	Monthly	End of month	No evidence of compliance.	
7.2.4	Control and management of leachate	Separate "clean" and "dirty" stormwater collection systems and discharge "clean" stormwater off site				The Independent Auditor confirmed that various clean water diversion drains are in place at the site, includeing a rain flap to reduce stromwater entering the landfill area.	Appendix A - Schedule 4 Condtiion 15d
7.2.4	Control and management of leachate	Separate "dirty" stormwater and leachate water flows				The Independent Auditor confirmed that various clean water diversion drains are in place at the site, includeing a rain flap to reduce stromwater entering the landfill area.	Appendix A - Schedule 4 Condtiion 15d
7.3.1	Groundwater monitoring network		Review suitability of monitoring network to meet objectives annually during annual review of water monitoring	Annual	Annual, refer to Section 7.3.5	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.3.1	Groundwater monitoring network	Install monitoring locations in accordance with objectives to set out in benchmark technique 4				All current groundwater monitoring locations are in compliance with EPL 5862, which supersedes the requirements of the LEMP.	EPL Annual Report 2017-2018
7.3.2	Groundwater monitoring program		Review suitability of monitoring network to meet objectives annually during annual review of water monitoring	Annual	Annual, refer to Section 7.3.5	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.3.2	Groundwater monitoring program		All bores - General water quality suite (refer to Table 12 of LEMP)	Quarterly	Refer to Section 7.3.5	Analytes tested (type and frequency) during groundwater monitoring are in compliance with EPL 5862, which supersedes the requirements of the LEMP	EPL Annual Report 2017-2018
7.3.2	Groundwater monitoring program		All bores - Leachate indicator suite	Quarterly	Refer to Section 7.3.5	Analytes tested (type and frequency) during groundwater monitoring are in compliance with EPL 5862, which supersedes the requirements of the LEMP	EPL Annual Report 2017-2018
7.3.2	Groundwater monitoring program		All bores - Metals and metalloids	Annual	Refer to Section 7.3.5	Analytes tested (type and frequency) during groundwater monitoring are in compliance with EPL 5862, which supersedes the requirements of the LEMP	EPL Annual Report 2017-2018
7.3.2	Groundwater monitoring program		All bores - Organic suite - limited	Quarterly	Refer to Section 7.3.5	Analytes tested (type and frequency) during groundwater monitoring are in compliance with EPL 5862, which supersedes the requirements of the LEMP	EPL Annual Report 2017-2018
7.3.2	Groundwater monitoring program		All bores - Organic suite - extended	Annual	Refer to Section 7.3.5	Analytes tested (type and frequency) during groundwater monitoring are in compliance with EPL 5862, which supersedes the requirements of the LEMP	EPL Annual Report 2017-2018
7.3.2	Groundwater monitoring program	Undertake groundwater monitoring as scheduled in management strategy				Analytes tested (type and frequency) during groundwater monitoring are in compliance with EPL 5862, which supersedes the requirements of the LEMP	EPL Annual Report 2017-2018
7.3.3	Surface water monitoring program		Surface water monitoring for baseline data set (refer to Figure 13 for monitoring locations)	Quarterly	Refer to Section 7.3.5	Surface water monitoring locations are compliant with the requirements of the EPL 5862. The requirements of the EPL 5862 supersedes the requriements of the LEMP	EPL Annual Report 2017-2018
7.3.3	Surface water monitoring program		Review suitability of monitoring network to meet objectives annually during annual review of water monitoring	Annual	Annual, refer to Section 7.3.5	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018

LANDFILL ENVIRONMENTAL MANAGEMENT PLAN Regular actions to be completed on site			Report number: Date:	117625003_061_R_Rev2 Sep-14			
Section	**Topic**	**Actions for compliance**	**Inspection, monitoring and maintenance schedule**	**Frequency**	**Timing**	**2017/2018 Annual Review**	**Reference**
7.3.3	Surface water monitoring program	Undertake surface water monitoring as schedule in management strategy				Surface water monitoring is undertaken according to the requirements of EPL 5862, which supersedes the requirement of the LEMP.	EPL Annual Report 2017-2018
7.3.4	Leachate Monitoring Program		Monitoring flow volume and regular chemical analysis	Unknown	Unknown	Leachate monitoring is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
7.3.4	Leachate Monitoring Program		Review suitability of monitoring network to meet objectives annually during annual review of water monitoring		Annual, refer to Section 7.3.5	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.3.4	Leachate Monitoring Program	Undertake leachate monitoring as schedule in management strategy				Leachate monitoring is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
7.3.5	Annual review of water monitoring	Undertake annual review of water monitoring				This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.4	Groundwater Assessment Program		Groundwater assessment program	When significant increases in indicator concentrations in groundwater occur	As required	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.4	Groundwater Assessment Program		Surface water monitoring	Quarterly and during overflow	March, June, September, December	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.4	Groundwater Assessment Program		Groundwater monitoring	Quarterly	March, June, September, December	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.4	Groundwater Assessment Program		Leachate monitoring	Quarterly and during overflow	March, June, September, December	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
7.6	Trade Waste Agreement		Sampling will occur at a point specified by Sydney Water	Unknown	Unknown	Sampling is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
7.6	Trade Waste Agreement		Sampling will occur over a full production day by combining equal volumes taken at 30 minute intervals	Unknown	Unknown	Sampling is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
7.6	Trade Waste Agreement		Sampling will occur on 7 May 2010 and every eight days thereafter	Unknown	Unknown	Sampling is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
7.6	Trade Waste Agreement		Discrete samples will be collected at the start and finish of each sample day and shall be analysed for pH	Unknown	Unknown	Sampling is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
7.6	Trade Waste Agreement		Composite samples will be analysed for ammonia, BOD, SS, and Total dissolved solids	Unknown	Unknown	Sampling is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
7.6	Trade Waste Agreement	The flow meter shall be accessible to Sydney Water for inspection				No evidence of compliance.	
7.6	Trade Waste Agreement	Sydney Water must be notified in writing within seven days of: Any failure to obtain samples; any loss of analytical data; any failture in the discharge flow meter				The EPL Annual Report 2017-2018 did not identify any events that required notification to Sydney Water in the reporting period.	EPL Annual Report 2017-2018
7.6	Trade Waste Agreement	Sydney Water must receive sampling results within 21 days of sampling				Sampling is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
8.2.3	Fire prevention		Odour observations	Continuous	Continuous	Odour observations are include in the daily inspection, as detailed on the daily inspection form for th tip face.	Appendix A - Schedule 4 Condition 26a
8.2.3	Fire prevention		Stockpiles of combustibles, fuels and flammable solvents stored inspected for fire risk	Quarterly	March, June, Sept, Dec	No evidence of compliance.	
8.2.3	Fire prevention		Bushfire maintenance inspection	Annually and during bushfire season	Prior to bushfire season	No evidence of compliance.	
8.3.1	Subsurface gas monitoring	Staged installation of gas monitoring wells				Gas monitoring wells were noted to be installed at the site, as observed by the Independent Auditor.	Appendix A - Schedule 4 Condition 29
8.3.1	Subsurface gas monitoring	Conduct monitoring at a frequency in accordance with benchmark 16 and Condition M2.2 of the EPL				Subsurface gas monitoring is undertaken in accordance with the Trade Waste Agreement.	EPL Annual Report 2017-2018
8.3.1	Subsurface gas monitoring		Subsurface gas monitoring	quarterly	March, June, Sept, Dec	Subsurface gas monitoring is undertaken according to the requirements of EPL 5862, which supersedes the requirement of the LEMP.	EPL Annual Report 2017-2018
8.3.2	Surface gas monitoring		Surface gas monitoring	quarterly	March, June, Sept, Dec	Surface gas monitoring is undertaken according to the requirements of EPL 5862, which supersedes the requirement of the LEMP.	EPL Annual Report 2017-2018
8.3.3	Gas accumulation monitoring program		Building gas accumulation monitoring	quarterly	March, June, Sept, Dec	Building gas accumulation monitoring is undertaken according to the requirements of EPL 5862, which supersedes the requirement of the LEMP.	EPL Annual Report 2017-2018
8.3.4	Annual review of landfill gas monitoring	Undertake annual review of landfill gas monitoring				This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
8.5	Greenhouse gas management plan	Prepare an annual action plan and progress report, focusing on ways of reducing both emissions and operating costs				WCC reported that greenhouse gas emissions are monitored continuously and reported via a contract provider monthly to assess the effectiveness and efficiency of the landfill gas management system. The effectiveness of the system is reported quarterly to Council as part of Council's annual plan. Internal annual sustainability reporting is also conducted which includes an annual review of greenhouse gas emissions at the landfill and assesses opportunities to implement further energy and greenhouse gas emissions improvements.	Appendix A - Schedule 4 Condition 30
9.2	Security of site		perimeter inspection of fence condition	Weekly	End of week	No evidence of compliance.	
9.3	Litter control		Litter fence, perimeter fence and surrounding roadsides inspection/litter retrieval	Daily or as required depending on the extent of litter produced	Afternoon	Daily inspections are carried out that include litter inspections, and cleaning of litter around the perimeter is conducted by WCC on a campaign basis at least weekly.	Appendix A - Schedule 4 Condition 9
9.3	Litter control	Litter fences are currently inspected and cleared from litter on a weekly basis. The Landfill Guidelines require inspection and clearing daily.				Daily inspections are carried out that include litter inspections, and cleaning of litter around the perimeter is conducted by WCC on a campaign basis at least weekly.	Appendix A - Schedule 4 Condition 9
9.4	Dust control		Visual dust observations	Daily	Continuous	Visual dust observations included in daily inspection of tip face.	Appendix A - Schedule 4 Condition 25
9.4	Dust control		Particulate matter monitoring (PM10 and TSP)	Monthly	End of month	This monitoring has been completed monthly since December 2017, with the exception of April 201 and May 2018.	Annual Review Section 3
9.4	Dust control		Deposited dust monitoring	Monthly	End of month	This monitoring has been completed monthly since March 2017.	Annual Review Section 3
9.5	Pest, vermin and noxious weed control	A weed management strategy shall be developed				Biosis was commissioned by WCC to review the existing Vegetation and Biodiverisity Management Plan (Biosis, 2013). This review included management actions which included weed management for the site, to be undertaken within a 12 month period from July 2017.	Updated Vegetation Management Plan (Biosis, July 2017).
9.5	Pest, vermin and noxious weed control		Visual observation for when pest/vermin/weed species seem to be increasing	Daily	Continuous	No evidence of compliance.	
9.5	Pest, vermin and noxious weed control		Bait stations for vermin	Monthly	End of month	No evidence of compliance.	
9.5	Pest, vermin and noxious weed control		Noxious weed survey by site staff	Quarterly	March, June, Sept, Dec	A vegetation condition assessment was completed in June 2017, however there is no evidence that quarterly weed surveys are completed at the site.	
9.5	Pest, vermin and noxious weed control		Trapping programs	As required	As required	No evidence of compliance.	
9.7	Noise control	Noise attenuation devices should be installed on all equipment on site				No evidence of compliance.	
9.8	Traffic control		Traffic flow	Continuous	Continuous	No evidence of compliance.	
9.9	Firefighting capacity	Mitigation measures outlined in Section 8.2.3 for bushfire protection should be implemented				No evidence of compliance.	
9.9	Firefighting capacity		Inspection of fire extinguishers (by contractor)	Annually	December	No evidence of compliance.	
9.9	Firefighting capacity		Inspection of fire extinguishers (by Waste Coordinator or Leading Hand)	Monthly	End of month	No evidence of compliance.	
9.9	Firefighting capacity		All firefighting equipment and facilities shall be checked for damage/condition	Weekly	End of week	No evidence of compliance.	
9.9	Firefighting capacity		All firefighting equipment and facilities shall be test operated	quarterly	March, June, Sept, Dec	No evidence of compliance.	
9.9	Firefighting capacity		Check fire equipment signposted to Australian standards and accessibility	quarterly	March, June, Sept, Dec	No evidence of compliance.	
9.9	Firefighting capacity		Review capacity of fire fighting	Every 12 months	December	No evidence of compliance.	
11.1	Reporting		Annual return documents	Annual	July?	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
11.1	Reporting		Notification of environmental harm	As required	As required	Notification of environmental harm has not been required during the reporting period.	
11.1	Reporting		Written report (Annual Report)	Annual	July?	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
11.1	Reporting		Total tonnage of waste received and tonnage of specific source-seperated wastes	Monthly	14th day of each month	WCC report tonnages to the EPA on a monthly basis as a requirement of Council's Environment Protection Licence.	Appendix A - Schedule 3 Condition 5
11.1	Reporting		Record of fires	As required	As required	No evidence of compliance.	
11.1	Reporting		Incident reporting	As required	As required	No evidence of compliance.	
11.1	Reporting		Trade Waste agreement reporting	21 days after sampling	21 days after sampling	This requriement is met by annual reporting for EPL 5862.	EPL Annual Report 2017-2018
11.1	Reporting		Sydney Water notification in the event of any failure to obtain samples; loss of analytical data, failure of discharge flow meter	Within seven days	Within seven days	The EPL Annual Report 2017-2018 did not identify any events that required notification to Sydney Water in the reporting period.	EPL Annual Report 2017-2018
11.1	Reporting		AEMR	Annual	Annual	This document	Annual Review 2017-2018

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APPENDIX

C

EPL5862 WHYTES GULLY LANDFILL ANNUAL REPORTS 2015-2018

Whytes Gully Landfill Annual Report 2017-2018

Environmental Protection Licence 5862

8201819601

Prepared for

Wollongong City Council

26 July 2018

wollongong
city of innovation

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Document Information

Prepared for	Wollongong City Council
Project Name	Environmental Protection Licence 5862
File Reference	8201819601 R001 Whytes Gully Annual Report.docx
Job Reference	8201819601
Date	26 July 2018
Version Number	2

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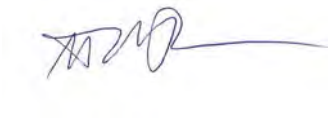
Effective Date 26/07/2018

Approved By:



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Date Approved 26/07/2018

Ryan Stirling
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Date Approved 26/07/2018

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
0	23/06/2018	Draft for client review	MB	MT
1	12/07/2018	Final for client review	MB	MT:RS
2	26/07/2018	Final for issue to EPA	MB	MT:RS

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1 Introduction

1.1 Background

Wollongong City Council (Council) owns and operates the Wollongong Waste and Resource Recovery Park (the Site), which is located on Reddals Road, Kembla Grange NSW. The Site is situated at the foothills of the Illawarra Escarpment south west of the Wollongong central business district on approximately 50 hectares. The Site is formally identified as Lots 50, 52 and 53 of Deposited Plan (DP) 1022266 and Lot 2 of DP 240557. The Site location is shown on **Figure 1** of **Appendix A** and a Site plan provided on **Figure 2** of **Appendix A**.

Council holds an Environmental Protection Licence (EPL) issued by the NSW Environment Protection Authority (EPA) under the *Protection of the Environment Operations Act 1997* (POEO Act). The Licence Number is 5862 and authorises the scheduled activity of waste disposal (application to land) at the Site with no limit on the scale of the activity.

A *Landfill Environmental Management Plan* (LEMP) was prepared in 2014 (Golder 2014) on behalf of Council to ensure that environmental compliance is maintained throughout Site operations. The management measures provided in the LEMP were developed in consideration of the *NSW Environmental Guidelines: Solid Waste Landfills (*EPA, 1996*)* and also addressed the monitoring and reporting requirements of EPL 5862. The NSW *Environmental Guidelines: Solid Waste Landfills* (EPA 1996) were replaced with the *Environmental Guidelines: Solid Waste Landfills, Second edition* (EPA, 2016). As such Council are updating the Site LEMP to ensure compliance with current legislative requirements.

1.2 Objectives

The objectives of this Annual Report are to provide the EPA with the following:

- A summary of compliance monitoring data gathered during the reporting period of the 29th of May 2017 to the 28th of May 2018.
- Interpretation of monitoring data to assess the environmental performance of the Site considerate of the conditions of the EPL.

1.3 Scope

1.3.1 Fieldwork

To meet the objectives of the Annual Report the following scope of works was undertaken during the reporting period in accordance with the requirement of EPL 5862:

- Surface gas monitoring at areas where intermediate or final cover has been placed;
- Subsurface gas monitoring of twelve (12) landfill gas monitoring wells;
- Gas accumulation monitoring within all buildings within 250m of deposited waste;
- Water monitoring at three (3) stormwater monitoring points;
- Groundwater monitoring at thirteen (13) monitoring wells;
- Tracking of waste tyres received at the Site; and
- Monitoring of trade wastewater at one (1) sampling point located at the pre-treatment discharge.

1.3.2 Reporting

Section 6 (R1) of EPL 5862 states that Annual Return and an Annual Report must be prepared by the licence holder. In accordance with Section 6 (R1.8) of the EPL this Annual Report provides an assessment of environmental performance relevant to the licence conditions including:

- Tabulated results of all monitoring data required to be collected by this licence;
- A graphical presentation of data from at least the last three years in order to show variability and/or trends;
- An analysis and interpretation of all monitoring data;

- An analysis of and response to any complaints received;
- Identification of any deficiencies in environmental performance identified by the monitoring data, trends or incidents and of remedial action taken or proposed to be taken to address these deficiencies; and
- Recommendations on improving the environmental performance of the facility.

This report has been prepared in accordance with the reporting conditions provided in Section 6 of the EPL and in consideration of the *Environmental Guidelines: Solid Waste Landfills, Second edition* (EPA, 2016) and *Requirements for publishing pollution monitoring data* (EPA, 2013). The Annual Return pro forma for the 2017/2018 reporting period was provided to the NSW EPA via their online lodgement platform E-Connect.

1.4 Site History and Configuration

1.4.1 Site History

Whytes Gully was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. Initially, the 'western gully' section was landfilled. The western gully is unlined by modern standards and was used for waste deposition from 1982 to 1993. Initially coal wash refuse was used to provide daily cover, and later steel furnace slag was introduced around 1988 due to its stability in wet weather, as well as Council's inability to source local clean fill in sufficient quantities. The leachate collection network from the western gully passes through a series of rock drains at the centre of each lift. The rock drains connect with a riser and the leachate flows from riser to riser, and eventually to the leachate collection well at the base of the western gully. The western gully section of the landfill has been capped with clay with a thickness between 1m and 4m.

Development of the 'eastern gully' section received consent in approximately 1992, following extensive public consultation. The eastern gully section is lined with a single layer of HDPE smooth liner, over a subsoil drainage layer of 5mm gravel and a corrugated groundwater drainage system. The eastern gully was excavated to rock and was developed in two stages, beginning with the first stage 80 to 100m above the slope from the current toe of the landfill embankment. The leachate is drained from the first stage of the eastern gully via a 300mm corrugated drainage pipe at the base and a 300mm thick sand layer above the liner.

The second stage of the eastern gully is situated in front and above the first stage, with extended leachate drains and HDPE liner. From 2014 to 2016, the eastern gully underwent extensive surface reshaping works in order to reduce rainwater infiltration, increase surface water diversion, to ensure consistent cover depths and to prepare the surface for the new landfill cell base liner.

Construction of Stage 3 of the landfill commenced during August 2013, with the first cell, Cell 1A, completed in 2014 which is situated below the eastern gully. Placement of waste commenced in Cell 1A around March 2015. Council has since constructed Cell 1B in 2015 and commenced filling. Cell 2 is currently being constructed.

Leachate is collected from all landfilled areas at the site and treated in a 3 stage process. The leachate is initially collected in a primary holding pond that utilises biological process and aeration primarily to strip the leachate of ammonia. The leachate is then pumped to a smaller, shallower pond with a larger surface area to increase the speed of this process on a batch by batch basis. From the smaller pond the leachate is then pumped to a sequential batch reactor that in conjunction with a filtration system eliminates the residual contaminants in the leachate to a standard that is suitable for acceptance by sewer under the sites Trade Wastewater Agreement with Sydney Water.

The location of each cell and significant Site features such as leachate ponds and shown on **Figure 2** of **Appendix A**).

2 Site Setting

2.1 Topography and Drainage

The Site is situated on a south west facing slope, which is dominated by a roughly east-west directional ridgeline along the northern boundary. The landfill deposition areas are located within two historical gullies, the western gully landfill and the eastern gully landfill. The eastern gully landfill is the current location of waste deposition with the western gully was historically filled until approximately 1993.

The topography of the Site is subject to variability due to the nature of landfilling, however, in general the Site is characterised by moderate to steep slopes. An elevation profile created utilising Nearmap for an aerial image captured on 19th of January 2018 shows that the lowest elevations of the Site are located in the south western portion with an approximate relative level (RL) of 15 m Australian Height Datum (AHD), and the highest elevations are located in the north eastern portion with an approximate RL of 100 m AHD. Approximate contours are shown on **Figure 4** of **Appendix A**.

2.2 Soil and Geology

The *1:100,000 geological map 'Wollongong-Port Hacking'* (Department of Primary Industries, 1985) shows that the Site is on the boundary of two major geological formations. The southern portion of the site is underlain by fluvial sands, silts and clays associated with Dapto Creek, with sandstone of the Budgong formation underlying alluvial soils. The Budgong Sandstone formation typically comprises of red, brown and grey lithic sandstone. The northern portion of the site is underlain by interbedded lithic sandstone, coal, carbonaceous claystone, siltstone and claystone of the Pheasants Nest Formation. It is inferred that the Pheasants Nest formation would mainly be encountered on the ridgelines in the higher elevations of the Site.

A geotechnical investigation completed by Golder Associates (Golder 2012) summarised the Site geology into the following areas:

- **Pheasants Nest Formation**: the Pheasants Nest Formation was noted on the upper slopes across the northern portion the site. The material encountered was generally weathered sandstone that grades into fresh sandstone at depths typically less than 10 m below ground level (bgl). The residual soil is generally less than 2 m thick. Siltstone was encountered in zones throughout the sandstone at depths greater than about 15 m (based on the Maunsell 1992 investigation). Siltstone was not encountered in the Golder 2012 investigation.
- **Budgong Sandstone Formation**: the Budgong Sandstone Formation was located across the southern portion of the site. The sandstone generally had a weathering profile that extended to depths up to 15 m bgl. Zones of weathered siltstone had a maximum thickness of approximately 3m and were located intermittently throughout this formation.
- **Alluvial Soils**: alluvial soils consisted of colluvial / alluvial soil material (silty clay and silt with some sands and sub angular gravels and cobbles) and was located across the middle and south west portion of the site. Zones of alluvial soil had a maximum thickness of approximately 11m. This geological unit was inferred to be underlain by Budgong Sandstone.
- **Capping Layer and Landfill**: landfill and a capping layer are located across the completed areas of landfilling. The capping material consists of generally low to medium plasticity sandy clay and is typically has a thickness less than 1.5m. Landfill waste is located beneath the capping layer consisting predominantly of domestic waste including paper, plastic, wood, rubble and other materials. The depth to the base of the general waste fill was not well defined, however, a review of historical topographic data suggests that the thickness of the fill could be up to 52m within the eastern gully landfill. The landfilled areas were inferred to be underlain by the Pheasants Nest Formation.

2.3 Climate

Climate data for the Site has been taken from the Albion Park (Wollongong Airport) Bureau of Meteorology (BOM) Weather Station (ID 068241). The weather station is located approximately 10 km south of the Site and is considered an accurate representation of the conditions experienced at the landfill during the reporting period. **Table 2-1** summaries the key climatic data from the Albion Park weather station.

Table 2-1 Climatic Data – Albion Park Weather Station

	2017						2018					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Rainfall (mm)	42.2	1.4	24.8	0.0	24.0	116.4	49.8	56.0	116.6	46.6	18.2	12.8
Mean max temperature (°C)	18.3	18.5	18.9	22.6	23.6	23.4	27.4	28.1	26.7	25.9	25.2	21.2
Mean min temperature (°C)	7.1	5.1	6.7	7.7	11.9	13.1	17.2	17.0	16.3	15.5	13.6	8.1
Mean 9am wind speed (km/h)	12	12	20	22	13	11	12	13	12	10	10	12
Mean 3pm wind speed (km/h)	14	20	24	27	22	23	20	22	22	19	17	20
Mean 9am relative humidity (%)	78	64	53	40	66	66	69	68	70	76	68	68
Mean 3pm relative humidity (%)	61	42	44	41	61	59	68	61	61	62	62	54

Long-term averages for the Albion Park weather station are shown in **Table 2-2** and have been included for comparative purposes.

Table 2-2 Long Term Averages – Albion Park Weather Station

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Rainfall (mm)[1]	94.5	51.4	55.3	42.7	64.5	83.1	67.0	72.9	140.5	122.3	73.8	55.8
Mean max temperature (°C)[1]	18.1	17.6	18.8	21.4	23.1	24.0	25.6	27.0	26.3	25.3	23.1	20.6
Mean min temperature (°C)[1]	7.2	6.3	6.5	8.5	10.8	13.4	15.3	16.9	17.1	15.6	12.2	8.8
Mean 9am wind speed (km/h) [2]	13.6	14.4	15.0	15.3	14.4	12.9	12.7	11.6	9.8	8.1	10.7	12.4
Mean 3pm wind speed (km/h)[2]	17.6	18.1	21.8	22.6	20.9	20.9	21.5	21.6	20.0	18.9	17.7	17.1
Mean 9am relative humidity (%)[2]	73	68	61	57	58	67	66	68	74	76	68	69
Mean 3pm relative humidity (%)[2]	57	54	49	53	58	63	61	63	67	64	61	58

[1] Data recorded from 1999 – 2018

[2] Data recorded from 1999 - 2010

The climate data shows relatively dry weather during the current reporting period compared to the long term averages. Winter months were particularly dry as was the start of spring with no rainfall recorded in the month of September.

Average maximum and minimum temperatures were generally slightly higher than long term averages. Mean wind speeds were slightly increased but overall in-line with the long-term trends. Humidity results were in general accordance with long-term trends.

3 Field Investigations

3.1 Fieldwork Methodology

The subsections below describe the frequency of monitoring, monitoring method, monitoring locations and analytes for surface gas, subsurface gas, gas accumulation, stormwater and groundwater. The fieldwork methodologies implemented during the reporting period were developed in consideration of the guidance provided in the NSW EPA *Environmental Guidelines: Solid waste landfills (second edition)* (EPA 2016).

3.1.1 Surface Gas

Surface gas monitoring was completed during the reporting period to assess for potential surface gas emissions of methane emitting from the current and existing landfill areas at the site. Surface gas migration monitoring should demonstrate that the cover material and extraction system is controlling the emission of landfill gas.

The fieldwork methodology for surface gas monitoring is summarised below in **Table 3-1**. The location of each surface gas monitoring location is shown on **Figure 3** of **Appendix A**.

Table 3-1 Surface Gas Monitoring Methodology

Activity	Description
Frequency and Dates of Monitoring	Surface gas monitoring for methane was completed monthly during the reporting period in accordance with Section 5 (M2.2) of EPL 5862.
Monitoring Method	Methane was measured by a third party contractor, ALS Environmental, using an Inspectra Laser Gas Detector. The instrument used to measure methane concentrations was calibrated prior to each monitoring event. Surface gas monitoring was achieved by testing the atmosphere 5 centimetres above the ground surface in areas with intermediate or final cover where wastes have been placed. The monitoring was completed on calm days (winds below 10km/hr) and on transects with an approximate spacings of 25m.
Monitoring Locations	Surface gas monitoring for methane was undertaken at the following locations: ▪ The current active landfill cell: transects 2, 3, 5, 7 and 10 ▪ The former landfill cell to the north west of the current cell: transects A, C, D, E, F, G, H, and I ▪ Reddalls Road and Farmborough Road fence lines.

3.1.2 Subsurface Gas

Subsurface gas monitoring was completed during the reporting period to detect the potential presence of methane around the perimeter of the landfill cell to assess the potential for offsite migration of methane onto surrounding properties.

The fieldwork methodology for subsurface gas monitoring is summarised below in **Table 3-2**. The location of each subsurface gas monitoring location is shown on **Figure 4** of **Appendix A**.

Table 3-2 Subsurface Gas Monitoring Methodology

Activity	Description
Frequency	Subsurface gas monitoring for methane was completed monthly during the reporting period in accordance with Section 5 (M2.2) of EPL 5862.
Monitoring Method	Subsurface gas monitoring was measured by a third party contractor, ALS Environmental, using an Inspectra Laser Gas Detector. The instrument used to measure methane concentrations was calibrated prior to each monitoring event. Subsurface gas monitoring was achieved by testing the methane concentration in twelve landfill gas monitoring wells (listed below) that are situated around the northern, eastern and southern perimeters of the landfill. The contents of each well was sampled and analysed prior to potential dilution by air.
Monitoring Locations	Subsurface gas monitoring for methane was undertaken at twelve landfill gas monitoring wells, Point 21 (LFG MW1) to Point 32 (LFG MW12), in accordance with Section 5 (M2.3).

3.1.3 Gas Accumulation

Gas accumulation monitoring was completed periodically during the reporting period to demonstrate that gas is not accumulating at dangerous levels in enclosed spaces on or near the landfill.

The fieldwork methodology for gas accumulation monitoring is summarised below in **Table 3-3**. The location of each gas accumulation monitoring location is shown on **Figure 4** of **Appendix A**.

Table 3-3 Gas Accumulation Monitoring Methodology

Activity	Description
Frequency and Dates of Monitoring	Gas accumulation monitoring for methane was completed monthly during the reporting period in accordance with Section 5 (M2.2) of EPL 5862.
Monitoring Method	Methane was measured by a third party contractor, ALS Environmental, using an Inspectra Laser Gas Detector. The instrument used to measure methane concentrations was calibrated prior to each monitoring event. Gas accumulation monitoring was undertaken in all accessible buildings and other enclosed structures within 250m of deposited waste or leachate storage. Some buildings and structures within 250m were not assessed as they were inaccessible and/or the owner did not permit authority to access the building.
Monitoring Locations	Gas accumulation monitoring was undertaken at the following locations during the reporting period: ▪ Weighbridge ▪ Glengarry Cottage (administrative building)

3.1.4 Stormwater

Stormwater monitoring was completed periodically during the reporting period to detect excess sediment loads in stormwater leaving the site and/or potential cross-contamination of stormwater with landfill leachate.

The fieldwork methodology for stormwater monitoring is summarised below in **Table 3-4**. The location of each stormwater monitoring location is shown on **Figure 4** of **Appendix A**.

Table 3-4 Stormwater Monitoring Methodology

Activity	Description
Frequency and Dates of Monitoring	Stormwater sampling was completed annually in accordance with Section 5 (M2.3) of EPL 5862. Sampling was also meant to occur during an overflow event, however, no overflow events occurred during the reporting period. The annual stormwater sampling event took place on the 19th of February 2018.
Monitoring Method	Stormwater monitoring was completed by a third party contractor, ALS Environmental. Grab samples of water were collected using a scoop at the nominated sampling points (summarised below). The instrument used to measure water quality parameters was calibrated prior to each monitoring event.
Monitoring Locations	Stormwater samples were collected from the following monitoring points in accordance with Section 2 (P1.2) of EPL 5862: ▪ 1 (outlet at Reddalls Road) ▪ 33 (downstream monitoring point) ▪ 34 (upstream monitoring point).
Analytes	In accordance with Section 5 (M2.3) of EPL 5862 each stormwater sample was analysed for: ▪ Alkalinity ▪ Calcium ▪ conductivity ▪ filterable iron ▪ magnesium ▪ pH ▪ sodium ▪ temperature ▪ total phenolics ▪ Ammonia ▪ Chloride ▪ dissolved oxygen ▪ fluoride ▪ nitrate ▪ potassium ▪ sulfate ▪ total organic carbon ▪ total suspended solids

3.1.5 Groundwater

Groundwater monitoring was completed periodically during the reporting period to determine if groundwater was impacted by interactions with leachate.

The fieldwork methodology for groundwater monitoring is summarised below in **Table 3-5**. The location of each groundwater monitoring location is shown on **Figure 4** of **Appendix A**.

Table 3-5 Groundwater Monitoring Methodology

Activity	Description
Frequency and Dates of Monitoring	Groundwater monitoring was completed on a quarterly basis during the reporting period with sampling undertaken on ▪ August 2017 ▪ September 2017 (resample from August sampling event) ▪ November 2017 ▪ February 2018 ▪ May 2018
Monitoring Method	Groundwater was sampled by a third party contractor, ALS Environmental, using bailer technique. A pre-calibrated water quality meter used to measure groundwater quality parameters during monitor well purging. The collected groundwater samples were submitted to ALS Environmental for analysis of contaminants and parameters of interest (summarised below). Ground water levels were recorded before purging.
Monitoring Locations	Groundwater bores monitored during the reporting period included EPL monitoring points: 5 (GABH02), 9 (GMW102), 10 (GM103), 11 (GM104), 12 (GM105), 13 (GM106), 14 (GMW108S), 15 (GMW108D), 16 (GMW109S), 17 (GMW110), 18 (GMW111), 19 (GMW109D) and 20 (BH6)
Analytes	In accordance with Section 5 (M2.3) of EPL 5862 groundwater monitoring points 5, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 were analysed for: <u>Annually</u> ▪ Metals (aluminium, arsenic, barium, cadmium, chromium (hexavalent and total), cobalt, copper, lead, manganese, mercury, zinc) ▪ Benzene, toluene, ethylbenzene, xylene (BTEX) ▪ Fluoride ▪ Nitrate and nitrite ▪ Organochlorine pesticides (OCP) ▪ Organophosphate pesticides (OPP) ▪ Polycyclic aromatic hydrocarbons (PAH) ▪ Total petroleum hydrocarbons (TPH) ▪ Total phenolics <u>Quarterly</u> ▪ Alkalinity ▪ Calcium, magnesium, potassium, sodium, chloride, sulfate ▪ pH and conductivity ▪ Standing water level ▪ Total dissolved solids (TDS) ▪ Total organic carbon (TOC) ▪ Nitrogen (ammonia) <u>Additional Analysis</u> The Annual Report for the 2016/2017 reporting period noted an upward trend in heavy metal concentrations in groundwater monitoring points 11 and 16 (WCC 2017), particularly barium, chromium, cobalt and lead. In response to the apparent trend, the monitoring frequency of heavy metals in points 11 and 16 was increased from annually to quarterly during the 2017/2018 reporting period to assess the trend more closely. Following elevated concentrations during the August groundwater monitoring event aluminium, barium, cadmium, calcium, chromium, cobalt, copper, lead, manganese, nickel and zinc were tested for total and dissolved concentrations during the September 2017 monitoring event to distinguish between contaminant concentrations in sediments and water.

3.1.6 Trade Wastewater

Monitoring of trade waste was completed periodically during the reporting period to assess waste water discharge and confirm that water quality parameters were within the acceptable criteria. Discharge of trade waste to sewer is undertaken in accordance with the *Consent to Discharge Industrial Trade Wastewater* (Sydney Water 2017).

The fieldwork methodology for trade wastewater monitoring is summarised below in **Table 3-6**. The trade waste monitoring location is shown on **Figure 4** of **Appendix A**.

Table 3-6 Trade Wastewater Monitoring Methodology

Activity	Description
Frequency	Trade wastewater sampling was undertaken on the 11th of August 2017 and every 22 days thereafter. If trade wastewater was not discharged on the scheduled day, then the sample was taken on the next day that trade wastewater was discharged.
Monitoring Method	Trade wastewater was sampled by a third party contractor, ALS Environmental. Composite samples were collected over a 24 hour period using a Composite Auto-sampler, and pre and post monitoring samples were collected as grab samples. Composite samples were obtained over one full production day by combining equal volumes taken at 30 minute intervals. The volumes collected were at least 5,000 millilitres over the full day. The reading of the flowmeter was obtained at the commencement and conclusion of each sampling day. Discrete samples were collected and tested for pH and temperature at the start and finish of each sample day. The probe used to measure water quality parameters was calibrated prior to each monitoring event and the trade wastewater samples collected were submitted to ALS Environmental for analysis of parameters of interest (summarised below).
Monitoring Locations	In accordance with the *Consent* (Sydney Water, 2017) monitoring of trade wastewater was undertaken at a sampling point located at the pre-treatment discharge, excluding domestic sewage and prior to the point of connection to the Sewer. The specific monitoring location was on Site leachate treatment plant which is shown on **Figure 4** of **Appendix A**.
Analytes	Composite samples were submitted to ALS Environmental for analysis of the following: ▪ Electrical conductivity; ▪ Ammonia (as Nitrogen); ▪ Biochemical oxygen demand; ▪ Suspended solids; and ▪ Total dissolved solids. Discrete samples were tested on site for pH, electrical conductivity and temperature using a calibrated water quality meter. Additionally, the volume of wastewater discharged was obtained from the reading of the total flow on the flow metering system.

3.1.7 Waste Tyres

Waste tyres are received at the Site from public drop off and from Council's On Call Household Cleanup service. All tyres received at the Site are temporarily stored in a steel bin and subsequently removed for off-site recycling by a tyre recycling contractor (Tyrecycle Pty Ltd). Waste tyres are not disposed of or buried at the Site.

Council display a NSW EPA Fixed QR2id Plate on the inbound weighbridge to enable inbound vehicles disposing waste tyres to exchange information regarding their load to the EPA under Clause 76 of the Waste Regulation. Any vehicles that fail to scan the QR2id plate at the entry to the landfill are reported by Council to the Waste Operations division of the EPA on a monthly basis (no later than 7 days following the end of each month).

Council follow a procedure (Procedure – Reporting un scanned inbound waste tyres to EPA, TRIM No. Z16/175510) developed to manage waste tyres in a manner that satisfies their obligations under the POEO (Waste) Regulation 2014. The procedure was prepared in consideration of the *Asbestos and Waste Tyre Guidelines* (EPA 2015).

4 Data Quality Objectives

The NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, which is endorsed by the NSW EPA under s105 of the *Contaminated Land Management Act 1997*, requires that Data Quality Objectives (DQOs) are to be adopted for all assessment and remediation programs. The DQO process as adopted by the NSW EPA is described within US EPA (2000) *Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations*.

4.1 Data Quality Objectives

The DQO process has been used to establish a systematic planning approach to setting the type, quantity and quality of data required for making decisions based on the environmental condition of the Site. The DQO process involves the following seven steps detailed in **Table 4-1**.

Table 4-1 Data Quality Objectives

Activity	Description
Step 1: State the Problem	An Annual Report is required as a condition of EPL 5862 to assess the environmental performance of the Site during the 2017/2018 reporting period. The Annual Report will determine the type, concentrations, and extent of potential contamination / parameters in the matrices sampled including landfill gas (surface and subsurface), leachate, surface water and groundwater.
Step 2: Identify the decision / goal of the study	The NSW EPA requires an Annual Report to confirm if the environmental performance of the Site meets the licence conditions and regulatory obligations of EPL 5862.
Step 3: Identify the information inputs	The primary inputs to the decisions described above are: ▪ Assessment of landfill gas, leachate, surface water and groundwater in accordance with direction of Section 5 (Monitoring and Recording Conditions) of EPL 5862. ▪ Assessment of management procedures for waste tyres. ▪ Laboratory analysis of samples for the contaminants and parameters of interest defined in Section 5 of EPL 5862. ▪ Assessment of analytical results against applicable performance criteria and Section 3 (Limit Conditions) of EPL 5862. ▪ Review of complaints recorded during the reporting period that relate to odour originating from the Site. ▪ Aesthetic observations material encountered during sampling. Assessment of the suitability of the analytical data obtained, against the Data Quality Indicators (DQIs) outlined below.
Step 4: Define the boundaries of the study	The study site is located at Reddals Road, Kembla Grange NSW. The lateral extent of the study is the site boundaries, as shown on **Figure 2** of **Appendix A**. The vertical extent of the study extends into the landfill gas and groundwater monitoring wells installed during previous investigations. The temporal boundaries of the study are from the 29th of May 2017 to the 28th of May 2018 (i.e. the reporting period).
Step 5: Develop the analytical approach	The decision rules for the Annual Report include: ▪ The sampling points, contaminants and parameters of interest, frequency of sampling and sampling method will meet the requirements EPL 5862. ▪ Samples requiring laboratory analysis will be analysed at National Association of Testing Authorities (NATA) accredited laboratory. ▪ Laboratory QA/QC results will indicate reliability and representativeness of the data set. ▪ Laboratory Limits of Reporting (LORs) will be below the applicable guideline criteria for the analysed contaminants and parameters of interest, where possible. ▪ Applicable guideline criteria will be sourced from EPL 5862 and other NSW EPA endorsed guidelines (as necessary). If the concentration of a contaminant or parameter of interest is outside of the acceptable limit additional works may be required to assess the potential risk.

Activity	Description
Step 6: Specify performance or acceptance criteria	To ensure the results obtained are accurate and reliable, sampling and analysis was undertaken in accordance with the guidance provided in EPL 5862. DQIs are used to assess the reliability of field procedures and analytical results. In particular, the DQIs within NSW EPA (2017) are used to document and quantify compliance. DQIs are described below, and are presented in **Table 4-2**, below: ▪ Completeness – A measure of the amount of useable data (expressed as %) from a data collection activity. ▪ Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event. ▪ Representativeness – The confidence (expressed qualitatively) that data are representative of each media present on the site. ▪ Precision – A quantitative measure of the variability (or reproducibility) of data. ▪ Accuracy (bias) – A quantitative measure of the closeness of reported data to the true value.
Step 7: Develop the Plan for Obtaining Data	Sampling and Analysis has been undertaken in compliance with EPL 5862 by qualified technical staff with analysis completed by a NATA accredited Laboratory. Results are discussed within this report.

4.2 Data Quality Indicators

The following DQIs referenced in Step 6 in **Table 4-1**, have been adopted in accordance with the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*. The DQIs outlined in **Table 4-2** assist with decisions regarding the contamination status of the site, including the quality of the laboratory data obtained.

Table 4-2 Summary of Data Quality Indicators

Data Quality Indicator	Frequency	Data Acceptance Criteria
Completeness		
Field documentation correct	Each sampling event	All samples
Suitably qualified and experience sampler	Each sampling event	All samples
Appropriate lab methods and limits of reporting (LORs)	Each sampling event	All samples
Chain of custodies (COCs) completed appropriately	Each sampling event	All samples
Compliance with all sample holding times	All samples	All samples
Comparability		
Consistent standard operating procedures for collection of each sample. Samples should be collected, preserved and handled in a consistent manner	All samples	All samples
Experienced sampler	All samples	All samples
Climatic conditions (temperature, rain, wind etc) recorded and influence on samples quantified (if required)	All samples	All samples
Consistent analytical methods, laboratories and units	All samples	All samples
Representativeness		
Sampling technique appropriate for each media and analytes (appropriate collection, handling and storage)	All samples	All Samples

Samples homogenous	All samples	All Samples
Detection of laboratory artefacts, e.g. contamination blanks	-	Laboratory artefacts detected and assessed
Samples extracted and analysed within holding times	All samples	All samples
Precision		
Laboratory duplicates	1 per 20 samples	<20% RPD Result > 20 × LOR <50% RPD Result 10-20 × LOR No Limit RPD Result <10 × LOR
Accuracy (Bias)		
Surrogate spikes	All organic samples	50-150%
Matrix spikes	1 per 20 samples	70-130%
Laboratory control samples	1 per 20 samples	70-130%
Method blanks	1 per 20 samples	<LOR

5 Performance Criteria

Environmental monitoring data gathered during the reporting period was screened against the applicable criteria for each sample type / matrix as summarised below.

5.1 Surface Gas

The results of surface gas monitoring were screened against the criteria provided in the *Environmental Guidelines* (EPA 2016). Specifically, the threshold level for further investigation and potential action was detection of methane at any point of the landfill above 500 parts per million (ppm).

5.2 Subsurface Gas

The results of subsurface gas monitoring were screened against the criteria provided in the *Environmental Guidelines* (EPA 2016). Specifically, the threshold levels for further investigation and corrective action were detection of methane at concentrations above 1% (volume/volume) and carbon dioxide at concentrations of 1.5% (v/v) above established natural background levels.

5.3 Gas Accumulation

The results of gas accumulation monitoring within enclosed buildings and structures were screened against the criteria provided in the *Environmental Guidelines* (EPA 2016). Specifically, the threshold level for further investigation and corrective action was detection of methane at concentrations above 1% (v/v).

5.4 Water

5.4.1 Stormwater

In accordance with Section 3 (L1.2) of EPL 5862 the performance criteria for stormwater was no discharge of contaminated stormwater to waters under dry weather conditions (less than 10mm of rainfall within a 24hr period) or a storm event/s of less than 1:10 year, 24 hour recurrence interval (less than 297.4 mm of rainfall within a 24 hour time period).

The contaminants and parameters applicable to stormwater samples are provided in Section 5 (M2.3)

In addition, and in accordance with Section 3 (L2) of EPL 5862, the performance criteria for the stormwater monitoring and discharge point at Reddalls Road, known as Monitoring Point 1, include:

- pH: a 100 percentile concentration limit of 6.5 to 8.5
- Total Suspended Solids: a 100 percentile concentration limit of 50 mg/L

Samples were also screened against the guidelines summarised below in **Section 5.4.3**

5.4.2 Leachate Discharge

In accordance with Section 3 (L1.3) of EPL 5862 the limit for leachate was no discharge of leachate to waters under dry weather conditions (less than 10mm of rainfall within a 24hr period) or a storm event/s of less than the 1:25 Average Return Interval (ARI), 24 hour recurrence interval (less than 371.5 mm of rainfall within a 24 hour time period). The performance criteria adopted for leachate discharges was based on records regarding the timing and nature of leachate discharges during the reporting period.

5.4.3 Groundwater

The selected performance criteria for groundwater samples were based on the recommendations of the *Environmental Guidelines* (EPA 2016) and in consideration of the land use, site setting and the plausible interactions between potential contaminants and human and environmental receptors. A conceptual site model is provided in **Section 8.9** that further discusses these interactions.

The Environmental Guidelines (EPA 2016) screening groundwater analytical results against the *National Environment Protection (Assessment of Site Contamination) Measure* (National Environment Protection Council, 2013), specifically:

> Schedule B1, Table 1C Groundwater Investigation Levels, which summarises trigger values from:
  - *Australian Water Quality Guidelines* (ANZECC 2000):

The results were screened against the criteria for 80%, 90% and 95% species protection trigger levels, which refers to the percentage of species expected to be protected. A brief overview of each protection level is provided below:

- The 80% protection level trigger values apply to ecosystems that are highly disturbed with limited conservation value;
- The 90% protection level trigger values apply to ecosystems that are moderately disturbed with low conservation value; and
- The 95% protection level trigger values apply to ecosystems that are slightly to moderately disturbed with a moderate conservation value.

Each protection trigger level was applied to groundwater data gathered during the reporting period, however, given the high level of disturbance at the site and the predominantly industrial surrounding land use the 90% levels are considered most appropriate to adopt as a performance criteria.

- *Australian Drinking Water Guidelines* (National Health and Medical Research Council and the Natural Resource Management Ministerial Council, 2011, updated 2014) (ADWG).

Surface water and groundwater are not utilised for human consumption at the Site, however, it is plausible that groundwater is used for agricultural (irrigation and stock watering). As such the ADWG have been adopted.

> Schedule B1, Table 1A (4) Health Screening Levels groundwater for petroleum hydrocarbons.

5.4.4 Trade Wastewater

Trade wastewater analytical results were screened against the criteria provided in the *Consent* (Sydney Water, 2017). The *Consent* provides criteria for a variety of parameters for the long term average daily mass (LTADM) and the maximum daily mass (MDM).

In addition to analytical performance criteria the *Consent* provides limits for aesthetic properties of trade wastewater including temperature, colour, pH, fibrous materials, gross solids and flammability, and limits to the rate of discharge of wastewater to sewer.

5.5 Waste - Tyres

Section 3 (L3.2) of EPL 5862 states that the licensee must not dispose of any tyres on the premises which:

> Have a diameter of less than 1.2 metres;

> Are delivered at the premises in a load containing more than 5 whole tyres; and

> Became waste in the Sydney Metropolitan Area.

Section 3 (L3.3) states that tyres stockpiled on the premises must:

> Not exceed fifty tonnes of tyre at one time;

> Be located in a clearly defined area away from the tipping face;

> Be managed to control vermin; and

> Be managed to prevent any tyres from catching fire.

5.6 Odour

In accordance with Section 3 (L4) of EPL 5862 offensive odour must not emit beyond the boundary of the premises. The performance criteria adopted for potential offensive odour emissions was occurrences (if any) of complaints from members of the public relating to odour.

6 Results

Monitoring results gathered during the reporting period are provided in the data tables in **Appendix B** and are summarised in the relevant subsections below. Laboratory certificates of analysis and quality reports have not been appended to this report due to the large number of files, however, they can be provided upon request.

A list of ALS Environmental Work Order numbers applicable to environmental monitoring and analysis completed during the reporting period are summarised below in **Table 6-1**.

Table 6-1 Laboratory Work Order Numbers

Sample Media	Work Order Number	
Groundwater	EW1802085	EW1800650
	EW1703553	EW1800652
	EW1704003	EW1802296
	EW1704789	
Stormwater	EW1703487	EW1801054
	EW1800651	EW1800935
Trade Wastewater	EW1702528	EW1704412
	EW1702795	EW1704913
	EW1703130	EW1705356
	EW1703409	EW1705429
	EW1703660	EW1800340
	EW1703690	EW1800726
	EW1704251	EW1801099

6.2 Gas

6.2.1 Surface Gas

The highest reported concentration of methane was 144 ppm measured at transact 10 during the October 2017 monitoring event, below the threshold level for further investigation and corrective action of 500 ppm.

Surface gas monitoring results from the reporting period are summarised in **Tables 1A** to **1F** of **Appendix B**.

6.2.2 Subsurface Gas

The highest reported concentration of methane was 0.0067% (v/v), measured in monitoring point 27 (LFGMW7) during the May 2018 monitoring event, below the threshold level for further investigation and corrective action of 1% (v/v).

Monitoring points 31 (LFGMW11) and 32 (LFGMW12) were inaccessible during the April monitoring event.

Subsurface gas monitoring results from the reporting period are summarised in **Table 2** of **Appendix B**.

6.2.3 Gas Accumulation

The highest reported concentration of methane was 0.00044 % (v/v), measured within the weighbridge during the April 2018 monitoring event, below the threshold level for further investigation and corrective action of 1 % (v/v).

Gas accumulation monitoring results from the reporting period are summarised in **Table 3** of **Appendix B**.

6.3 Stormwater

Controlled releases of uncontaminated stormwater occurred on ten (10) occasions during the reporting period with standing water level, turbidity and pH measured and validated prior to each release.

pH and turbidity were measured using a water quality meter prior to each release and samples of stormwater were collected and submitted for laboratory analysis of TSS on four occasions to validate the accuracy of field turbidity measurements. Prior to each release pH was measured between 6.5 to 8.5 and TSS was below 50 mg/L.

Stormwater monitoring results from the annual sampling event are summarised in **Table 4** of **Appendix B** with the pertinent findings provided below:

- Ammonia was reported at a concentration of 1.82 mg/L in the stormwater sample collected from Point 33, above the ANZECC 90% protection trigger level of 1.43 mg/L. Ammonia was reported below the performance criteria in all other samples.
- The highest reported concentration of TSS was 76 mg/L in the stormwater sample collected from Point 33. The TSS concentration of Point 1 was 16 mg/L, below the EPL limit specific to Point 1 of 50 mg/L.
- A pH of 9.7 was reported in the stormwater sample collected from Point 1, outside of the acceptable pH range from the EPL of 6.5 to 8.5.

6.4 Leachate

No uncontrolled off site discharges of leachate occurred during the reporting period under dry or wet weather.

6.5 Groundwater

6.5.1 Groundwater Levels

Groundwater levels measured at the site during the reporting period are summarised in **Table 5A** of **Appendix B** and ranged from 1.65m below ground level (bgl) in groundwater monitoring Point 20 (BH6) to 11.7m bgl in groundwater monitoring point 12 (GMW105).

6.5.2 Laboratory Results

Groundwater data tables are provided in **Tables 5A** to **5F** of **Appendix B** with the pertinent findings summarised below:

- Benzene, toluene, ethylbenzene and xylenes (BTEX) and TPH were not detected above the laboratory limits of reporting (LORs) in any groundwater sample collected during the reporting period (refer to **Table 5B** of **Appendix B)**.
- PAH was not detected above the laboratory LORs in any sample, however, it is noted that the adopted criteria for anthracene and benzo(a)pyrene were below the laboratory limit of reporting (refer to **Table 5A** of **Appendix B)**. Therefore the results of anthracene and benzo(a)pyrene cannot be screened against the criteria, which is further discussed in **Section 9.2**.
- A summary of heavy metals results is provided below and tabulated in **Table 5C** of **Appendix B**:
  - Aluminium (total) concentrations ranged from 0.21mg/L in monitoring point 19 to 229 mg/L in point 11, with all samples containing aluminium above the ANZECC 90% protection trigger level of 0.08 mg/L. The dissolved concentration of aluminium in point 11 was 0.44 mg/L and in point 16 was 0.42 mg/L, also above the ANZECC 90% trigger level.
  - Arsenic, barium and mercury were below reported at concentrations below the adopted performance criteria for all samples.
  - Cadmium (total) concentrations ranged from below the laboratory limit of reporting (multiple samples) to 0.0006 mg/L in monitoring point 11. The concentration recorded for point 11 is above the ANZECC 90% protection trigger level of 0.0004 mg/L but below the ADWG criteria of 0.002 mg/L. Dissolved cadmium was below the laboratory LOR in point 11.
  - Chromium (hexavalent) was not detected above the laboratory limit of reporting in all groundwater samples collected during the reporting period, however, it is noted that the adopted criteria is below the laboratory limit of reporting. Therefore the results cannot be screened against the performance criteria, which is further discussed in **Section 9.2**.
  - Copper (total) concentrations ranged from 0.002 mg/L (multiple samples) to 0.32 mg/L (point 11) with all results above the ANZECC 90% protection trigger level of 0.0018 mg/L but below the ADWG criteria of 2 mg/L. Dissolved copper was below the laboratory LOR for point 11 and 0.003 mg/L, above the ANZECC 90% protection trigger level but below the ADWG criteria.

- Lead (total) concentrations ranged from below the laboratory limit of reporting (point 15) to 0.32 mg/L (point 11) with all results above the ANZECC 90% protection trigger level of 0.0018 mg/L but below the ADWG criteria of 2 mg/L. Dissolved lead was below the laboratory LOR for point 11 and point 16.
- Manganese (total) concentrations ranged from 0.021 (point 15) to 7.15 mg/L (point 11) with seven samples above the ANZECC 90% protection trigger level of 2.5 mg/L and nine samples above the ADWG criteria of 0.5 mg/L. Dissolved manganese was 0.415 mg/L in point 11 and 3.19 mg/L in point 16, above the ANZECC 90% protection trigger level.
- Nickel (total) concentrations ranged from 0.028 (point 16) to 0.88 mg/L (point 11) with seven samples above the ANZECC 90% protection trigger level of 0.013 mg/L. Dissolved nickel was 0.002 mg/L in point 11 and 0.009 mg/L in point 16, below the criteria.
- Zinc (total) concentrations ranged from 0.01 mg/L (multiple samples) to 0.61 mg/L (point 11) with fifteen samples above the ANZECC 90% protection trigger level of 0.015 mg/L. Dissolved zinc was below the laboratory LOR in point 11 and 0.022 in point 16, above the ANZECC 90% trigger level.
- Specific trigger values were not provided in the adopted performance criteria for calcium, cobalt, magnesium and potassium.

> A summary of inorganics is provided below and tabulated in **Table 5D** of **Appendix B**:

- Ammonia concentrations ranged from below the laboratory limit of reporting (multiple samples) to 0.82 mg/L in point 16, with all samples below the adopted performance criteria.
- Fluoride concentrations ranged from 0.1 mg/L (point 16) to 0.9 mg/L in point 20, with all samples below the adopted performance criteria.
- Nitrate concentrations ranged from 0.01 mg/L (point 14) to 0.52 mg/L in point 17, with all samples below the adopted performance criteria.
- Specific trigger values were not provided in the adopted performance criteria for alkalinity, chloride, nitrite, sodium, TDS, TOC and sulfate.

> A summary organochlorine pesticides is provided below and tabulated in **Table 5E** of **Appendix B**:

- OCP contaminants aldrin and dieldrin, chlordane, dichlorodiphenyltrichloroethane (DDT), endrin, lindane and heptachlor were not detected above the laboratory limit of reporting in any sample, however, it is noted that the adopted criteria were below the laboratory limit of reporting. Therefore the results cannot be screened against the criteria, which is further discussed in **Section 9.2**.

> A summary organophosphorus pesticides is provided below and tabulated in **Table 5E** of **Appendix B**:

- OPP contaminants azinophos methyl, chlorpyrifos, diazinon, dimethoate, malathion, methyl parathion and parathion were not detected above the laboratory limit of reporting in any sample, however, it is noted that the adopted criteria were below the laboratory limit of reporting. Therefore the results cannot be screened against the criteria, which is further discussed in **Section 9.2**.
- Bromophos-ethyl, carbophenothion, chlorfenvinphos, dichlorvos, ethion, fenthion, fethyl parathion, monocrotophos, fenamiphos and pirimphos-ethyl were not detected above the laboratory limit of reporting and were therefore below the adopted performance criteria.

> Electrical conductivity ranged from 354 µS/cm (point 9) to 5,730 µS/cm (point 5) (refer to **Table 5F** of **Appendix B)**.

> pH ranged from 5.8 (point 12) to 7.5 (point 11) (refer to **Table 5F** of **Appendix B)**.

> Total organic carbon ranged from 8 mg/L (point 5) to 9 mg/L (point 20) (refer to **Table 5F** of **Appendix B)**.

6.6 Trade Wastewater

A summary of trade wastewater monitoring is provided below and tabulated in **Table 6** of **Appendix B**:

Trade wastewater monitoring was undertaken 18 times during the reporting period. The results of monitoring showed that on each occasion volume discharge, total dissolved solids, suspended solids, ammonia as N, biochemical oxygen demand and temperature were within the acceptable criteria provided in the *Consent* (Sydney Water, 2017).

pH was measured at the commencement and completion of each monitoring event and a non-conformance with the Sydney Water criteria was recorded on the 17th of August 2017. A pH of 6.5 was recorded at commencement and completion of monitoring, which is outside of the acceptable criteria of 7 to 10.

6.7 Waste Tyres

Section 3 (L3.2) of the EPL provides limitations on the size and number of waste tyres that can be disposed at the premises. Council do not dispose of waste tyres on Site but instead receives and temporarily stores them until they are collected by an external contractor, Tyrecycle Pty Ltd, for recycling. As such the license condition L3.2 do not apply to the site operations during the reporting period.

Section 3 (L3.3) of the EPL states a number of requirements relating to tyre stockpiles at the Site. Stockpiles of types on Site during the reporting period were compliant with L3.3, specifically:

- Tyre stockpiles did not exceed fifty tonnes at one time. The tyre storage bin at the site has a capacity of 150 tyres, which when full equates to significantly less than fifty tonnes. Council's Operations team regularly scheduled outbound loads of waste tyres to ensure that the capacity of the bin is not exceeded;
- The tyre stockpile was clearly defined and situated approximately 450m from the tipping face during the reporting period; and
- The tyre stockpile was scheduled for frequent removal mitigating the potential for vermin impact and fire risk.

6.8 Odour

A total of nine complaints were received by Council from members of the public during the reporting period relating to offensive odour detected at an offsite location. An Environmental Incident Form was completed for each complaint with the pertinent information summarised below in **Table 6-2**. The complaints received during the EPL reporting period were used to assess the Sites environmental performance for odour.

Table 6-2 Complaints Summary

Date of Complaint	Nature of Complaint	Additional Information
14/06/2017	Offensive odour	Offensive odour reported to EPA on 14 June 2017. EPA forwarded the complaint to Wollongong City Council - waste services via email on 27 June 2017. Exceptional circumstances were not undertaken at the time of the complaint. The deodoriser was present on site and accessible for workers.
19/08/2017	Offensive odour	An after-hours call was received by EPA (Ref 147636). A strong offensive odour was reported from near Whytes gully tip, with the odour first noted around 5pm. Reviewed weather station data and waste works diary to identify issues that may be responsible. No unusual operational activities occurred around the incident date and time. The team working at the tip face were reminded to follow operational procedures and to cover waste in accordance with the EPL.
13/01/2018	Offensive odour	A complaint of offensive odour was received by the EPA from an individual located at the Farmborough Heights area at around 12:30pm. The weather was hot (30°C) with previous days up to 40°C+. Winds were gusting 50km/hr from the west-north-west. No unusual operational activities occurred at Site around the complaint date and time. The Site Waste Coordinator visited Highview Drive (Farmborough Heights) and could not detect an offensive odour.
16/01/2018	Offensive odour	Three complaints of offensive odour were received by the EPA from the Farmborough Heights area. The individual who reported the odour advised the odour was ongoing and offensive. No unusual operational activities occurred at Site around the complaint date and time. The Site Waste Coordinator visited Highview Drive (Farmborough Heights) and could not detect an offensive odour. The individual who reported the odour was contacted by phone by Council to confirm the nature of the complaint.
17/01/2018	Offensive odour	A complaint of offensive odour was received by the EPA from an individual located at the Farmborough Heights with the reported odour described like a "horse stable smell". The weather was warm (21°C) with previous days up to 40°C+. Winds were gusting 48km/hr from the south-south-east. No unusual operational activities occurred at Site around the complaint date and time. The Site Waste Coordinator visited Highview Drive (Farmborough Heights) and could not detect an offensive odour.

Date of Complaint	Nature of Complaint	Additional Information
5/03/2018	Offensive odour	An offensive odour was reported to the EPA at 8:00am from an individual located at Farmborough Heights. The odour was noted for a period of 1.5hr on two consecutive mornings on the 5th and 6th and was described by the individual as faint. The individual also noted that the odour is usually smelled early in the morning following rainfall events and suspects it is associated with removal of daily cover. There was a slight breeze from the south-west at the time of the complaint. No unusual operational activities occurred at the time of the complaint. The deodoriser was in place and utilised prior to lifting lids in the morning.
20/03/2018	Offensive odour	An individual from Farmborough Heights reported a strong offensive odour. The wind at the time of the complaint was up to 41km/hr from the south-east.
20/04/2018	Offensive odour	An offensive odour was reported to the EPA at from an individual from Farmborough Heights at 1:00pm. The individual reported the presence of a strong odour from within their house that they believed was originating from the Site. The weather conditions at the time of the complaint was mild with only slight winds from the south-east. No unusual operational activities occurred at Site around the complaint date and time. The team working at the tip face were reminded to follow operational procedures and to cover waste in accordance with the EPL.

7 Quality Assurance / Quality Control

A detailed overview of the QA/QC program including internal laboratory QA/QC is included in **Appendix C**. A summary of the results of the QA/QC performance are included in the following sections.

7.1 Laboratory QA/QC

The selected analytical laboratory, ALS Environmental, undertake internal QA/QC procedures which include the analysis of method blanks, internal duplicate samples, laboratory control samples, matrix spikes and surrogate recovery. Additionally, laboratory QA/QC measures include receipt, logging, storage, preservation, holding time and analysis of samples within the method specified.

A review of the laboratory QA/QC procedures indicates that laboratory QA/QC procedures were within specified ranges for all samples with the exception of three duplicates, four laboratory control samples and four matrix spikes. In addition, five matrix spike recoveries were unable to be determined as the background level was greater than or equal to the four times the spike level.

Samples were received and stored appropriately and all samples were analysed within the specified holding time.

7.2 Data Useability

The data validation process of laboratory QA/QC data indicates that the reported analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon for the purpose of the Annual Report for EPL 5862.

8 Discussion

The data and information gathered during the reporting period is discussed below in consideration of the performance criteria. In addition and in accordance with Section 6 (R1.8) of EPL 5862, historical laboratory results have been tabulated and presented in graphical format that compares data from at least three years (where available).

Trend graphs are provided in **Appendix D** and summarised below in the sections below, however, trend graphs and a discussion has not been provided for OCP, OPP, PAH, BTEXN or Phenolics as these contaminants have historically never been reported above the laboratory limit of reporting.

8.1 Surface Gas

Surface gas monitoring completed during the reporting period did not identify surface methane concentrations that exceeded the threshold level. As such non-conformances of the EPL did not occur during the reporting period with respect to surface gas emissions.

8.2 Subsurface Gas

Subsurface gas monitoring completed during the reporting period did not identify subsurface methane at concentrations that exceeded the threshold level. As such non-conformances of the EPL did not occur during the reporting period with respect to subsurface gas.

8.3 Gas Accumulation

Gas accumulation monitoring completed during the reporting period did not identify methane at concentrations that exceeded the threshold level. As such non-conformances of the EPL did not occur during the reporting period with respect to gas accumulation.

8.4 Stormwater

No uncontrolled releases of contaminated stormwater occurred during the reporting period under dry weather or storm events. As such non-conformances of the EPL did not occur with respect to releases of stormwater.

A pH of 9.7 was measured at Point 1 at the time of sample collection during the annual monitoring event, which is outside of the acceptable range of 6.5 to 8.5 provided in EPL 5862. The pH at Points 33 and 34 were 7.5 and 7.6, respectively, substantially below that measured at Point 1 and within the neutral range. The elevated pH at Point 1 correlates with high concentrations of alkalinity (carbonate as calcium carbonate), chloride, sodium and sulfate when compared with that of Points 33 and 34.

An elevated concentration of ammonia was reported in the sample collected from Point 33, exceeding the ANZECC 90% protection limit. Points 1 and 34 were significantly lower with concentrations marginally above the laboratory LOR. Point 33 is located in an adjoining property to the south and the sample was collected from a surface water body approximately 150 m south west of the Site boundary. The elevated ammonia concentration at this location may indicate potential interaction with leachate originating at the Site through groundwater discharging into the surface water body or from a release of leachate from storage ponds.

Reddalls Road is a public road that is frequently utilised by vehicles associated with local heavy industry. The road passes between the Site boundary and Points 1 and 33 and it is inferred that surface water runoff from Reddalls Road would flow to each monitoring point. It is also noted that monitoring Points 1 and 33 were stagnant at the time of sampling and that releases of stormwater and leachate did not occur during the reporting period. These factors are further discussed in the recommendations in **Section 9.2**.

8.4.1 Trend Analysis

A series of graphs showing trends in stormwater contaminant and parameter levels are provided in **Sheets 1A** to **1E** of **Appendix D** and are discussed below.

The pH of Point 1 increased sharply from last reporting period from 7.7 to 9.7 as shown on **Sheet 1D**. The pH at Point 1 has historically ranged from 7.1 to 8.0 in the previous three years with the measurement of 9.7 the highest pH recorded at this location. The pH of Point 33 and 34 remained relatively stable.

TSS at Point 33 showed an upward trend from the previous year but remained within the typical range during the previous three years.

The remainder of contaminants and parameters did not deviate significantly from the concentrations reported during the previous three years.

8.5 Groundwater

8.5.1 Groundwater Levels

Interpretation of groundwater levels across the Site from the reporting period indicate that the inferred groundwater flow direction is from the north east to the south west, which is consistent with the local topography and is shown on **Figure 4** of **Appendix A**. Groundwater is situated at the greatest depths in the higher elevations of the Site toward the north eastern corner and is shallowest in the south eastern boundary in close proximity to the nearest surface water body, Dapto Creek.

It is noted that groundwater monitoring points 9, 12 and 13 were dry during the February 2018 monitoring event. These wells are located in the higher elevations of the site along the northern and western boundary. Climatic data from the Albion Park weather station summarised in **Table 2-1** indicates that 49.8mm of rain fell in December and 56.0mm in January, down from the long-term averages of 67.0mm and 72.9mm, respectively.

Consequently the wells that were dry during the February monitoring event were unable to be sampled and analysed for the 'yearly' contaminants listed in table M2.3 of the EPL.

8.5.1.1 Trend Analysis

A series of graphs showing groundwater level trends are provided in **Sheet 2** of **Appendix D** and discussed below.

Groundwater levels have remained relatively stable over the previous three years with the exception of EPA monitoring points 5, 9, 12 and 13.

The groundwater depth recorded in monitoring point 5 during the May 2017 monitoring event was 10.65 meters below ground level (mbgl), significantly deeper than historical groundwater depths recorded (typically around 5 mbgl). Monitoring point 5 is situated in the lower lying portion of the Site toward the western boundary. The groundwater levels remained stable during the 2017/2018 reporting period and the unusual groundwater depth of 10.65 mgbl recorded in 2017 is considered an anomaly or a reporting error by ALS Environmental, with subsequent depths returning normal values.

The groundwater depth in monitoring point 9 has historically fluctuated between 1.95 to 11.68 mbgl but had never been recorded as dry. Monitoring point 9 is situated at a relatively high elevation and is located along the northern boundary of the Site. The well was recorded as dry during the February 2018 monitoring event and may be a consequence of dry weather conditions prior to the sampling event.

The groundwater depth in monitoring point 12 has historically remained relatively stable fluctuating between 10 to 12 mbgl, but had never been recorded as dry. Monitoring point 12 is situated at a relatively high elevation and is located along the eastern boundary of the Site. The well was recorded as dry during the February 2018 monitoring event and may be a consequence of dry weather conditions prior to the sampling event.

Monitoring point 13 was recorded as dry during the reporting period which is consistent with historical records. Monitoring point 12 is situated at a relatively high elevation and is located along the eastern boundary of the Site.

8.5.2 Laboratory Results

Groundwater analysis completed during the reporting period showed that the majority of contaminants and parameters of interest specified in EPL 5862 were below the laboratory LORs or the performance criteria, including BTEX, TPH, PAH, ammonia, fluoride and nitrate.

Performance criteria are not provided for alkalinity, chloride, nitrite, sodium, TDS, TOC and sulfate however the results were generally comparable with historical data and are not considered unusual or concerning in the context of the Site and surrounding land use. EPA monitoring points 5, 17, 18 and 20 are located in the lower elevations of the Site toward the western and southern western boundary and generally had the highest concentrations. EPA monitoring points 9, 10, 12 and 13 generally contained the lowest levels of the parameters, with the wells located in the higher elevations toward the northern and eastern boundary. This indicates that wells situated down gradient of buried waste have the relatively higher concentrations.

Numerous heavy metal concentrations were reported above the adopted performance criteria during the reporting period including aluminium, cadmium, copper, lead, manganese, nickel and zinc. The

concentrations reported were for total metals in accordance with the EPL requirement, however, it is important to note that the adopted screening criteria recommended by the *Environmental Guidelines* (EPA 2016) are intended for application to concentrations of dissolved metals. As such the exceedances are not necessarily indicative of environmental concern with the contaminant concentrations most likely attributed to the presence of sediment in unfiltered samples. Monitoring Points 11 and 16 typically had the highest concentrations of total metals and samples from both locations were analysed for both total and dissolved metals on during the September monitoring event. The results show that that dissolved heavy metal concentrations were significantly lower than total metals, with exceedances of the adopted criteria generally limited to aluminium, copper, manganese and zinc in Point 16.

8.5.2.1 Trend Analysis

A trend graph and discussion has not been provided for OCP, OPP, PAH, BTEXN or Phenolics as these contaminants have never been reported above the laboratory limit of reporting.

A series of graphs showing trends in groundwater contaminant and parameter levels for annual monitoring are provided in **Sheet 3A** to **3I** of and graphs for quarterly monitoring are provided in **Sheets 3A** to **3I** of **Appendix D**, and are discussed below.

The trend graphs from the annual groundwater monitoring event shows that contaminant and parameter concentrations have remained steady and relatively consistent with the three years prior, with a general decline in contaminant concentrations. It is noted that several monitoring wells were dry during the annual monitoring event and therefore trend analysis was unable to be completed for the entire well network.

8.6 Trade Wastewater

Trade wastewater was discharged into the sewer network in accordance with the Consent (Sydney Water 2017) with only one non-conformance recorded during the reporting period. A pH of 6.5 was measured at the commencement and completion of monitoring during the event on the 17th of August 2017.

The pH of 6.5 was attributed to damage to the leachate line during construction of a new leachate pond with the civil earthworks contractor, Ertech, striking the leachate line. Process and Operations Engineers from INNACO indicated that the low pH was most likely a consequence of damaged to the leachate line.

pH measurements during the monitoring events prior to and after the 17th of August monitoring event were between 7.7 and 10 (within the acceptable criteria), indicating that the non-conformance of pH was an isolated occurrence and the repairs to the leachate line effectively mitigated the issue.

8.7 Waste Tyres

Waste tyres received at the site are managed in accordance with a procedure that satisfies Councils obligations under the POEO (Waste) Regulation 2014. Tyres are temporarily stored at the site before being collected by a third party contractor for recycling.

Non-conformances of the EPL did not occur during the reporting period with respect to waste tyres.

8.8 Odour

Section 3 (L4) of EPL 5862 states that offensive odour must not emit beyond the boundary of the premises. A total of nine complaints relating to odour were received from members of the public during the reporting period. In each instance the individual making the complaint believed the subject odour was originating from the Site.

The nearest sensitive receptor to the Site is a residential dwelling located approximately 150m north of the current active tip face and the suburb of Farmborough Heights (predominantly low density residential) is located approximately 500m north east.

Given the relative close proximity of sensitive receptors (residences) to the Site, and based on a review of the odour complaints received during the reporting period, it appears that odours thought to originate at the Site occur predominantly when the wind is from the south, following rainfall and on hot days.

The controls for mitigating release of odour, including application of daily cover and the use of a deodoriser, were utilised at the time of each complaint. Additionally, the Site Waste Coordinator visited the location of the complaint on numerous occasions to validate the complaint, however was unable to detect an offensive odour on any occasion.

8.9 Conceptual Site Model

Generally, a conceptual site model (CSM) provides an assessment of the fate and transport of contaminants of potential concern (CoPC) relative to site specific subsurface conditions with regard to their potential risk to human health and the environment. The CSM takes into account site-specific factors including:

- Source(s) of contamination;
- Identification of CoPC associated with past (and present) source(s);
- Vertical, lateral and temporal distribution of CoPC;
- Site specific lithologic information including soil type(s), depth to groundwater, effective porosity, and groundwater flow velocity; and
- Actual or potential receptors considering both current and future land use both for the site and adjacent properties, and any sensitive ecological receptors.

Based on the results discussed in this report a CSM has been developed and is outlined below in **Table 8-1**. Additional details are included in the sections that follow as necessary.

Table 8-1 Conceptual Site Model

CSM Element	Description
Contaminant Sources	Known contaminant sources at the site include: ▪ Historical site use as a landfill since the early 1980's for deposition of domestic and commercial waste streams. ▪ Leachate resulting from degradation of buried waste and interaction with groundwater.
Site Current and Future Use	The site is an operational landfill that receives waste from the Wollongong City Council local government area. It is anticipated that the landfill will remain operational and continue to receive waste for the foreseeable future with a projected lifespan of at least 40 years based on current landfilling rates.
Site Geology	A geotechnical investigation (Golder 2012) indicates that the site is situated on two geological units. The Pheasants Nest Formation was noted on the upper slopes across the northern portion the site. The material encountered was generally weathered sandstone that grades into fresh sandstone at depths typically less than 10 m below ground level. The Budgong Sandstone Formation was located across the southern portion of the site. The sandstone generally had a weathering profile that extended to depths up to 15 m bgl. In addition to the natural geology the historical and current landfill cells have been covered with a capping layer typically comprising low to medium plasticity sandy clay with a thickness less than 1.5m. Underlying the landfill cap is predominantly domestic waste including paper, plastic, wood, rubble and other materials.
CoPCs	The CoPC listed in EPL 5862 include heavy metals (aluminium, arsenic, barium, cadmium, chromium (hexavalent and total), cobalt, copper, lead, manganese, mercury, zinc), polycyclic aromatic hydrocarbon, total petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylenes, naphthalene, organochlorine pesticides, organophosphate pesticides and phenolics. In addition to CoPC the EPL identifies potentially hazardous landfill gasses including methane and carbon dioxide.
Extent of Impacts	The extent of potential contamination would primarily be located immediately below and down gradient of the tip face. Monitoring undertaken during the reporting period indicates that contaminants above the adopted criteria are limited to heavy metals aluminium, cadmium, copper, lead, manganese and zinc. Other CoPC were reported below the laboratory limit of reporting or the adopted criteria, however, it is noted that several contaminants including PAHs, OCPs and OPPs were unable to be screened against the adopted criteria as the laboratory LORs was reported higher than the criteria. Methane was detected during the reporting period atop the current and previous tip face (surface gas), subsurface and within enclosed structures, however, the concentrations were below the threshold level for further investigation and corrective action.
Potential Human Receptors	Potential human receptors include: ▪ Employees working at the tip face in earthworks plant and machinery;

	▪ Employees working within enclosed structures including the weighbridge and office; ▪ Trespassers who illegally access the site; ▪ Contractors constructing the new landfill cell; ▪ Contractors undertaking scheduled environmental monitoring (surface water, groundwater and landfill gas); and ▪ Individuals working or living near the site.
Potential Ecological Receptors	Potential ecological receptors include: ▪ Dapto Creek which is the nearest offsite down gradient surface water body and the downstream surface water bodies including Mullet Creek and Lake Illawarra; ▪ Groundwater under the site being impacted as a result of the vertical migration of contaminants from leachate and buried waste; and ▪ Flora and fauna on the site interacting with contaminants in the soils including birds scavenging from the tip face.
Potential Contaminant Pathways	Potential contaminant pathways include: ▪ Dermal contact with contaminated materials including soil, waste and hazardous building materials; ▪ Dermal contact with contaminated media including surface water, groundwater and leachate; ▪ Inhalation of hazardous landfill gases emanating from buried waste and leachate; ▪ Inhalation of volatile contaminants and/or asbestos fibres; ▪ Ingestion of contaminant impacted materials including soil, waste and hazardous building materials; ▪ Potential contaminant uptake by vegetation; and ▪ Potential ingestion of contaminant impacted fresh produce (fruit and vegetables) grown down gradient of the site.

8.9.2 Data Gaps and Uncertainties

The assessment of potential contamination at the site was based on a site inspection and review of available historical reports and information. As such, the lateral and vertical extent of potential contamination in soil is unknown.

9 Conclusions and Recommendations

9.1 Conclusions

The following can be concluded based on the monitoring undertaken during the reporting period:

- Council implemented an environmental monitoring program during the 2017/2018 reporting period that satisfied the conditions and requirements of EPL 5862 and the *Consent to Discharge Industrial Trade Wastewater* (Sydney Water, 2017).
- Water contained in stormwater and leachate ponds at the Site were managed such that uncontrolled releases of contaminated water did not occur during the reporting period.
- Monitoring results show that surface and subsurface hazardous ground gases were not present at concentrations that exceed the adopted performance criteria.
- Stormwater samples collected from surface water bodies down gradient of the site generally showed contaminant and parameter concentrations below the performance criteria. pH and ammonia were outside of the acceptable limits at Point 1 and 33, respectively. The results of future sampling events should be monitored closely to confirm the concentrations as discussed below in **Section 9.2**.
- Heavy metals were detected above the performance criteria in groundwater at numerous monitoring wells, however, samples were submitted for analysis of total metals and therefore the elevated concentrations may be due to the presence of sediments. Future monitoring events should also assess dissolved concentrations of heavy metals to determine if elevated metals are attributed to sediment or if they exist in dissolved phase, as discussed below in **Section 9.2**.
- Management and handling of waste tyres at the Site was undertaken in a manner that was compliant with the EPL conditions.
- Complaints from the public relating to offensive odours originating from the Site were received during the reporting period. Each complaint was investigated by Council to confirm the nature of the complaint and to identify suitable corrective actions. Recommendations designed to improve odour at the site are provided below in **Section 9.2**.

9.2 Recommendations

Based on the conclusions of this report the following actions are recommended:

- Contaminant detections at stormwater sampling Points 1 and 33 could be the result of interference from runoff originating at Reddalls Road as opposed to the Site. Furthermore the surface water bodies were stagnant at the time of sampling and releases of stormwater and leachate did not occur during the reporting period. It is suggested that the sample collection point for Point 1 be relocated upstream to a point between Reddalls Road and the Site boundary (if possible) to eliminate the risk of cross contamination. Given that an elevated concentration of ammonia was reported in Point 33 and a pH of 9.7 was measured at Point 1, the results should be monitored closely during future monitoring events to confirm if the unusual results were anomalous or indicative of potential leachate interaction with stormwater bodies.
- The laboratory limit of reporting was above the adopted screening criteria for several contaminants including PAHs, OCPs and OPPs. Future analysis of these contaminants should be undertaken at an ultra-trace level to ensure the limit of reporting is below the applicable criteria.
- Consideration should be given to completing the annual groundwater sampling earlier during the reporting period to allow a greater opportunity to collect samples. The annual event was scheduled for February 2018 and monitoring wells 9, 12 and 13 were dry. These wells are located in the higher elevations of the site along the northern and western boundary and provide important data showing groundwater contaminant concentrations up-gradient of the tip face. Conducting the annual sampling event earlier during the reporting period will allow alternate opportunities for sampling in the event of dry wells being encountered.
- Consideration should be given to the replacement or removal of EPA groundwater monitoring well 13. The well has been recorded as consistently dry since 2012 with only two records of groundwater interception during monitoring.

> Historically water samples have been submitted for laboratory analysis of total heavy metals in accordance with EPL 5862. Water samples should also be analysed for dissolved metals (ie filtered) to determine if elevated metals are attributed to sediment or if they exist in dissolved phase.

10 References

ANZECC (2000), Australian Water Quality Guidelines, 2000

Australian Standards (1999), AS 4482.2-1999 Guide to the Sampling and Investigation of Potentially Contaminated Soil - Volatile Substances, 1999

Golder Associates (2012), Geotechnical Investigation, Whytes Gully Landfill, 2012

Golder Associates (2014), Landfill Environmental Management Plan, Whytes Gully Landfill, 2014

NEPC (2013), National Environment Protection (Assessment of Site Contamination) Measure, 2013

NHMRC (2014), Australian Drinking Water Guidelines, 2014)

NSW EPA (1996), NSW Environmental Guidelines: Solid Waste Landfills, 1996

NSW EPA (2013), Requirements for publishing pollution monitoring data, 2013

NSW EPA (2015), Asbestos and Waste Tyre Guidelines, 2015

NSW EPA (2016), Environmental Guidelines: Solid Waste Landfills (Second Edition), 2016

NSW EPA (2017), Guidelines for the NSW Site Auditor Scheme (3rd Edition), 2017

NSW DPI (1985), 1:100,000 geological map Wollongong-Port Hacking, 1985

Sydney Water (2017), Consent to Discharge Industrial Trade Wastewater, 2017

US EPA (2000), Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations, 2000

APPENDIX A

FIGURES

Location Plan

WHYTES GULLY WASTE DISPOSAL DEPOT

Legend

- Site Boundary
- Distance Buffer
- Major Watercourse (LPI)

Land Use (ABS, 2016)

- Other
- Commercial
- Education
- Hospital/Medical
- Industrial
- Parkland
- Primary Production
- Residential
- Water

FIGURE 1

1:60,000 Scale at A3

km
0 0.5 1 1.5 2

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-06-15 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-006-LocationPlan.mxd 01

Site Plan

WHYTES GULLY WASTE DISPOSAL DEPOT

Haul road
Borrow pit
Small vehicle transfer station
Alternate leachate pond
Secondary leachate pond
Primary leachate pond
Settling pond 1
Settling pond 2
Surface water polishing pond
Leachate treatment plant
MRF Building and amenities
Weighbridge
Landfill gas management area
Revolve Centre & Recycling Area
Glengarry Cottage
FARMBOROUGH ROAD
DAPTO CREEK
REDDALLS ROAD

Legend

- Site Boundary
- Watercourse (LPI)
- Cadastre (DFSI-SS, 2017)
- Eastern Gully Landfill
- Western Gully Landfill
- New Landfill (Under Construction)

FIGURE 2

1:5,000 Scale at A3

m
0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-06-15 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-001-SitePlan.mxd 02
Aerial imagery supplied by nearmap (January, 2018)

ID	Latitude	Longitude
1	-34.461282	150.798123
2	-34.461707	150.801046
3	-34.461173	150.798302
4	-34.461495	150.801312
5	-34.461167	150.797993
6	-34.460442	150.802531
7	-34.460744	150.799456
8	-34.460662	150.800985
9	-34.460543	150.79948
10	-34.460406	150.801562
11	-34.460363	150.79919
12	-34.460305	150.801931
13	-34.459877	150.799587
14	-34.460263	150.802198
15	-34.459746	150.799557
16	-34.46015	150.802252
17	-34.459633	150.799504
18	-34.460049	150.802359
19	-34.459466	150.800126
20	-34.459508	150.802163
21	-34.459317	150.800473
22	-34.459198	150.80202
23	-34.45887	150.800838
24	-34.459055	150.802454
25	-34.458568	150.801338
26	-34.458847	150.802561
27	-34.458401	150.801948
28	-34.458776	150.80268
29	-34.463136	150.802109
30	-34.462029	150.801591
31	-34.463059	150.802341
32	-34.461703	150.801685
33	-34.462976	150.802555
34	-34.461435	150.801757
35	-34.46328	150.803183
36	-34.46102	150.80182
37	-34.463113	150.803519
38	-34.460763	150.802258
39	-34.463006	150.803882
40	-34.460828	150.80296
41	-34.463095	150.804387
42	-34.46081	150.803324
43	-34.462768	150.804721
44	-34.460816	150.803691
45	-34.46244	150.805036
46	-34.460834	150.804042
47	-34.461257	150.804917
48	-34.460364	150.8034

Surface Gas Monitoring Locations

WHYTES GULLY WASTE DISPOSAL DEPOT

Legend

- Site Boundary
- Surface Gas Monitoring Transect
- Cadastre (DFSI-SS, 2017)

FIGURE 3

1:5,000 Scale at A3

m
0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-06-15 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-002-SurfaceGas.mxd 01
Aerial imagery supplied by nearmap (January, 2018)

EPL ID	Latitude	Longitude
1	-34.465788	150.798241
2	-34.461495	150.798117
5	-34.462361	150.798127
9	-34.458563	150.800373
10 / 28	-34.460495	150.805903
11	-34.461171	150.796442
12 / 25	-34.462304	150.805465
13 / 24	-34.463246	150.804627
14	-34.463322	150.799269
15	-34.463408	150.799345
16	-34.465054	150.796328
17	-34.463322	150.79609
18	-34.462247	150.79629
19	-34.465092	150.796432
20	-34.465292	150.798669
21	-34.463294	150.801753
22	-34.463579	150.802467
23	-34.463598	150.80419
26	-34.461599	150.806093
27	-34.460933	150.805969
29	-34.460077	150.805912
30	-34.459686	150.805817
31	-34.459629	150.805265
32	-34.459544	150.804713
33	-34.466937	150.796376
34	-34.460624	150.795442
Glengarry Cottage	-34.465023	150.801355
Leachate Treatment Plant	-34.463926	150.798743
SWERF	-34.463935	150.801647
Weighbridge	-34.46375	150.799164

Groundwater, Surface Water and Subsurface Gas Monitoring Locations

WHYTES GULLY WASTE DISPOSAL DEPOT

Legend

- Site Boundary
- Dual Well (Groundwater and Gas)
- Gas Accumulation Monitoring Point
- Groundwater Monitoring Well
- Stormwater Monitoring Point
- Subsurface Gas Monitoring Well
- Trade Wastewater Monitoring Point
- Inferred Groundwater Flow Direction
- 5m Contours (LPI LiDAR, 2013)
- Cadastre (DFSI-SS, 2017)

FIGURE 4

1:5,000 Scale at A3

m
0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-07-19 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-004-Groundwater-SubsurfaceGas.mxd 03
Aerial imagery supplied by nearmap (January, 2018)

APPENDIX B

DATA SUMMARY TABLES

Transect	Point	Unit	Level for Investigation and Corrective Action	Date											
				5/06/2017	26/07/2017	8/08/2017	7/09/2017	9/10/2017	1/11/2017	11/12/2017	10/01/2018	14/02/2018	9/03/2018	11/04/2018	2/05/2018
1	1	ppm	500	-	-	-	-	-	-	-	-	-	-	2.8	-
	2			-	-	-	-	-	-	-	-	-	-	-	-
	3			-	-	-	-	-	-	-	-	-	-	-	-
	4			-	-	-	-	-	-	-	-	-	-	-	-
	5			-	-	-	-	-	-	-	-	-	-	-	-
2	1			-	-	-	-	-	-	1.9	-	2.9	3	3.4	5.3
	2			-	-	-	-	-	-	2.8	-	2.7	5.1	-	6.4
	3			-	-	-	-	-	-	2.4	-	2.6	6	-	6.4
	4			-	-	-	-	-	-	-	-	-	6.4	-	-
	5			-	-	-	-	-	-	-	-	-	1.5	3.8	-
3	1			1.6	-	NA	3	1.5	1.3	3.1	2	4.7	5.4	6.1	5.6
	2			1.4	-	-	4.5	1.3	1.3	1.3	2.5	8.3	9.2	4.9	6.4
	3			2	-	-	3.8	5.8	1.5	4.3	2.7	11.3	3.6	4.6	6
	4			3.2	-	-	3.8	4.4	1.7	2.1	7.6	4.1	3.7	4.7	6.5
	5			3	-	-	-	-	-	-	-	4.7	4.5		-
	6			-	-	-	-	-	-	-	-	-	-	-	-
	7			-	-	-	-	-	-	-	-	-	-	-	-
	8			-	-	-	-	-	-	-	-	-	-	-	-
	9			-	-	-	-	-	-	-	-	-	-	-	-
5	1			2.6	3.5	3	3.8	9.4	1.6	3.4	3.5	34.3	3.8	7.5	12.9
	2			1.9	8	4	5.3	6.6	1.8	2.8	2.4	26.2	2.5	4.8	9.3
	3			22.3	15.9	3	22.8	6.1	1.5	2.6	2.6	16.8	3.6	5.6	11.5
	4			34.7	15.2	3	43.1	82.1	1.8	4.6	5.8	16.5	6.5	4.8	28.2
	5			10.4	15	2.4	12.9	19.1	-	1.9	2.8	16.9	11	4.9	9.6
	6			7.7	8.4	8	-	-	-	1.8	-	-	6.4	-	-
	7			2.9	50.1	12	-	-	-	-	-	-	-	-	-
	8			4.5	16.1	4	-	-	-	-	-	-	-	-	-
	9			13.7	21.5	5.8	-	-	-	-	-	-	-	-	-
	10			8.3	23.9	4.6	-	-	-	-	-	-	-	-	-
	11			2	-	11.1	-	-	-	-	-	-	-	-	-
	12			-	-	3	-	-	-	-	-	-	-	-	-
	13			-	-	-	-	-	-	-	-	-	-	-	-

The threshold levels for further investigation and corrective action were adopted from the *Environmental Guidelines: Solid Waste Landfills* (EPA 2016)

Notes:
ppm: parts per million
"-" denotes not accessible

Transect	Point	Unit	Level for Investigation and Corrective Action	Date											
				5/06/2017	26/07/2017	8/08/2017	7/09/2017	9/10/2017	1/11/2017	11/12/2017	10/01/2018	14/02/2018	9/03/2018	11/04/2018	2/05/2018
6	1	ppm	500	-	3.3	3.8	18	-	-	-	-	-	-	-	-
	2			-	5.7	6.2	14	-	-	-	-	-	-	-	-
	3			-	-	4.9	14	-	-	-	-	-	-	-	-
	4			-	-	10.2	11.8	-	-	-	-	-	-	-	-
	5			-	-	8	15.1	-	-	-	-	-	-	-	-
	6			-	-	83	17.8	-	-	-	-	-	-	-	-
	7			-	-	22.3	14.8	-	-	-	-	-	-	-	-
	8			-	-	25.8	-	-	-	-	-	-	-	-	-
	9			-	-	49	-	-	-	-	-	-	-	-	-
	10			-	-	75	-	-	-	-	-	-	-	-	-
	11			-	-	33	-	-	-	-	-	-	-	-	-
7	1			2.4	4	-	11.8	11.9	13.1	4.3	2.1	6.5	2.1	10	6.4
	2			2.3	3.4	-	11.8	3.1	19.9	3.3	1.6	7	2.5	8.6	5.9
	3			3.4	2.8	-	5.6	3.8	16.8	4.4	1.9	11.6	1.9	11.2	4.5
	4			4	2.8	-	11.3	15.7	15.9	4.5	2.1	59.9	1.7	6.2	5.2
	5			3.3	12.2	-	17.1	5.7	9.3	4.6	2.3	8.2	2.3	6.5	35.6
	6			5.4	8.2	-	4.4	6.8	12.3	4.6	5.6	6.4	2.6	-	-
	7			12.3	6.5	-	13.9	12	13.8	-	-	-	-	-	-
	8			5.6	3.9	-	6.4	12.2	5.3	-	-	-	-	-	-
	9			2.1	-	-	2.2	11.4	5.2	-	-	-	-	-	-
	10			1.8	-	-	2.8	19.1	4.4	-	-	-	-	-	-
	11			3.6	-	-	3.6	6.5	16.8	-	-	-	-	-	-
	12			7.6	-	-	5.3	1.9	8.4	-	-	-	-	-	-
	13			4.8	-	-	3.8	-	9	-	-	-	-	-	-
8	1			-	-	-	-	-	8.9	8.9	-	-	-	-	-
	2			-	-	-	-	-	3.5	3.5	-	-	-	-	-
	3			-	-	-	-	-	2.4	2.4	-	-	-	-	-
	4			-	-	-	-	-	2.4	2.4	-	-	-	-	-
	5			-	-	-	-	-	3	3	-	-	-	-	-
	6			-	-	-	-	-	2.8	2.8	-	-	-	-	-
	7			-	-	-	-	-	-	-	-	-	-	-	-
	8			-	-	-	-	-	-	-	-	-	-	-	-

The threshold levels for further investigation and corrective action were adopted from the *Environmental Guidelines: Solid Waste Landfills* (EPA 2016)

Notes:
ppm: parts per million
"-" denotes not accessible

Transect	Point	Unit	Level for Investigation and Corrective Action	Date											
				5/06/2017	26/07/2017	8/08/2017	7/09/2017	9/10/2017	1/11/2017	11/12/2017	10/01/2018	14/02/2018	9/03/2018	11/04/2018	2/05/2018
10	1	ppm	500	30.1	0.7	4.4	1.9	6.1	6.1	5.8	5.7	5.2	2.2	9	6.7
	2			18.63	1.2	3.6	1.9	144	6.2	4	2.8	7.2	5.8	45	13.2
	3			15.6	1.2	10.8	1.9	20.8	3.4	6	2.4	29.9	1.3	50	10.2
	4			7.5	6.4	8.3	28.5	10.9	2.8	6	2	6.6	2.2	19	25.7
	5			20.1	4.1	18.3	12.6	39.9	3	3.2	21.6	11	4	31.1	13.3
	6			28.1	6	17.1	5.3	42.4	7.8	10	20.1	15.5	18.1	15	32.5
	7			30.4	10	10.1	23.3	14.9	10.3	6.7	6.9	41.1	10.4	24	17.8
	8			25.1	10.8	5.6	10.2	36.6	13.7	1..2	7.6	64.2	12.1	100	16.3
	9			10.1	10.6	9.2	-	20	13.9	14.4	11.8	11.2	19.4	10.2	-
	10			20.5	4.7	-	-	-	17.2	3.1	-	39.2	11.6	-	-
	11			-	5.1	-	-	-	30.2	50.1	-	19.9	1.7	-	-
	12			-	-	-	-	-	-	6.4	-	-	13.1	-	-
	13			-	-	-	-	-	-	3.4	-	-	20.2	-	-
	14			-	-	-	-	-	-	18.9	-	-	19.8	-	-
	15			-	-	-	-	-	-	12.1	-	-	11.4	-	-
A	1			9.4	1.4	2.2	1.7	2.3	1.8	1.5	1.7	1.7	2	1.3	3.1
	2			9.1	1.7	2.4	1.6	2.2	2.1	1.5	2.3	1.8	2.1	1.9	3.6
	3			9.4	1.8	2.2	1.7	2	2.2	1.5	2.2	1.8	2.1	1.7	4.2
	4			9.9	1.9	2	1.7	-	1.8	1.6	2.1	1.8	-	1	4
	5			-	2	2	1.7	-	-	-	2		-	1	3.8
	6			-	-	1.6	-	-	-	-	1.8		-	-	-
	7			-	-	-	-	-	-	-	-	-	-	-	-
	8			-	-	-	-	-	-	-	-	-	-	-	-
B	1			-	-	-	-	1.7	-	-	-	-	-	-	-
	2			-	-	-	-	1.6	-	-	-	-	-	-	-
	3			-	-	-	-	2.3	-	-	-	-	-	-	-
	4			-	-	-	-	2.6	-	-	-	-	-	-	-
	5			-	-	-	-	2.5	-	-	-	-	-	-	-
	6			-	-	-	-	4.5	-	-	-	-	-	-	-
	7			-	-	-	-	2.6	-	-	-	-	-	-	-
	8			-	-	-	-	2.6	-	-	-	-	-	-	-
C	1			-	2.2	2.6	-	-	1.8	3.2	2.3	1.8	1.6	1.1	4.2
	2			-	2.2	2.8	-	-	1.7	2.3	2.6	1.8	1.9	1.2	4.3
	3			-	2.2	3	-	-	1.6	2.7	2.3	1.8	1.5	1.4	3.6
	4			-	2.2	2.8	-	-	1.7	1.9	3.1	1.9	1.8	1.6	3.9
	5			-	2.1	2.5	-	-	1.5	1.6	2.7	1.9	2	4.8	9.9
	6			-	2.2	2.1	-	-	1.9	1.5	2.4	2.1	1.9	2.1	2.7
	7			-	2.3	1.9	-	-	1.9	1.6	3.6	3.1	2	1.6	5.6
	8			-	2.2	2	-	-	1.6	1.5	3.8	2	2.3	1.8	27.2
	9			-	2.3	-	-	-	-	1.6	8.2	50.3	2.8	1.7	19.1
	10			-	4.8	-	-	-	-	1.6	5.3	3.5	2.3	1.6	9.1
	11			-	-	-	-	-	-	-	-	1.8	-	-	9.5
	12			-	-	-	-	-	-	-	-	1.8	-	-	-

The threshold levels for further investigation and corrective action were adopted from the *Environmental Guidelines: Solid Waste Landfills* (EPA 2016)

Notes:
ppm: parts per million
"-" denotes not accessible

Transect	Point	Unit	Level for Investigation and Corrective Action	Date											
				5/06/2017	26/07/2017	8/08/2017	7/09/2017	9/10/2017	1/11/2017	11/12/2017	10/01/2018	14/02/2018	9/03/2018	11/04/2018	2/05/2018
D	1	ppm	500	9.9	0.5	2.1	1.5	2.2	-		2.7	1.6	1.4	2.2	1.3
	2			7.6	0.6	2.3	1.5	0.8	-	1.6	2.6	1.6	1.3	2	1.3
	3			10.1	0.6	2.3	1.5	1.2	1.5	2.2	3.8	1.7	1.4	2.1	1.4
	4			12.4	0.4	2.3	1.4	0.7	1.6	1.8	4	1.5	1.5	2.4	1.3
	5			11.9	0.3	1.6	1.6	1.1	1.2	1.5	4	2.4	1.7	3.8	1.3
	6			20	-	1.7	1.6	-	1.2	1.8	-	-	-	-	1.4
	7			23.8	-	-	1.5	-	1	-	-	-	-	-	-
	8			38.8	-	-	1.6	-	1.3	-	-	-	-	-	-
	9			-	-	-	1.7	-	-	-	-	-	-	-	-
E	1			34.3	1.8	2.6	2.2	2	2	1.8	2.2	2.3	1.8	2.1	2.2
	2			29.1	2.6	2.6	2.2	2.3	2	1.8	8.5	1.6	2.1	2.1	1.8
	3			22.3	3	2.4	1.9	1.5	1.8	1.5	2.1	1.9	1.8	2.2	1.5
	4			21.1	1.6	2.3	1.9	1.4	1.5	1.6	1.8	1.7	1.6	1.9	1.4
	5			12.1	0.9	1.8	1.9	2.3	1.6	1.6	3.2	1.7	3	2.8	1.6
	6			16.8	0.9	1.5	1.8	3.8	7.2	1.7	2.9	2	1.8	2.5	1.5
	7			10.6	0.7	2	1.8	1.4	1.6	1.7	2.3	1.8	1.9	2	1.2
F	1			12.9	2.6	2.5	2.1	3	2.4	1.8	3.8	1.8	2.1	2.1	2
	2			16.1	2.7	2.4	1.5	3.1	1.9	1.8	2.8	2	2.4	2	2
	3			15	2.4	2.1	1.5	3	2	2.2	1.9	1.9	1.6	1.9	2
	4			19.8	2.4	2.4	1.4	2	2.1	1.8	1.5	1.7	1.7	1.8	2.2
	5			25.5	2.3	2.5	1.4	1.2	2.1	1.8	2.8	2.3	2	1.8	2.2
	6			34.1	1.8	2.2	1.4	1.8	2.1	1.9	2.5	4.3	2.1	2.1	2.5
	7			33.9	2	2	1.4	1.4	2	1.7	1.9	1.7	2.7	2.5	1.8
	8			42.1	1.6	2.2	1.5	0.9	2.1	1.8	2.7	12.4	2.7	2.1	2.4
	9			-	-	-	-	1.5	-	-	-	-	-	-	-
G	1			11.9	3	2.1	1.7	2.5	2	1.8	2.3	1.4	2	1.6	3.3
	2			19	2.6	2.4	1.8	2.6	2	2.2	2.1	1.4	2.1	1.6	2.8
	3			20.5	2.9	2.3	1.7	2.6	2.1	2	2	1.3	2.2	1.7	3.1
	4			26.4	2.1	2.1	1.5	3.2	1.9	1.8	1.6	1.7	2.9	1.8	2.6
	5			29.1	2.3	2.2	1.5	2.5	1.7	1.8	2.6	1.8	2.4	1.9	2.1
	6			28.6	2	2.2	1.8	1.6	1.7	1.8	2.2	1.7	2.7	2	2.3
	7			25.9	2	1.9	1.8	1.7	1.9	1.9	2.8	1.6	2.5	25	2.2
	8			-	-	-	-	-	-	-	-	-	-	-	-
	9			-	-	-	-	-	-	-	-	-	-	-	-
	10			-	-	-	-	-	-	-	-	-	-	-	-

The threshold levels for further investigation and corrective action were adopted from the *Environmental Guidelines: Solid Waste Landfills* (EPA 2016)

Notes:
ppm: parts per million
"-" denotes not accessible

Transect	Point	Unit	Level for Investigation and Corrective Action	Date											
				5/06/2017	26/07/2017	8/08/2017	7/09/2017	9/10/2017	1/11/2017	11/12/2017	10/01/2018	14/02/2018	9/03/2018	11/04/2018	2/05/2018
H	1	ppm	500	14.9	2.4	3	1.7	2.3	2.1	1.1	3	1.5	2	1.9	8.9
	2			4.5	2.4	2.3	1.8	2.3	1.9	1.6	2.6	1.5	1.9	2	1.8
	3			14.3	2.4	2.6	1.8	2	1.7	1.7	2.8	1.4	1.5	5.1	1.4
	4			15.3	2.5	1.9	1.8	2.2	3.6	1.8	2.8	5.7	1.7	1.6	6
	5			13.1	2.5	2.1	1.8	2	1.8	1.6	2.8	2.5	2.1	1.6	4.2
	6			14.6	2.4	2.2	1.8	2.3	8.9	1.7	2.2	1.6	2	1.4	2.9
	7			-	2.6	2.6	-	-	-	-	-	-	-	-	-
	8			-	2.4	2.6	-	-	-	-	-	-	-	-	-
I	1			8.1	2.5	2.4	1.9	1	1.4	1.9	3.1	2.2	1.3	4.5	2.6
	2			11.4	3.4	1.9	1.8	1.4	1.3	1.9	3.7	2	1.2	2.2	1.9
	3			8.4	1.6	2	1.7	1.3	1.6	1.8	4.3	1.9	1.3	2.2	1.3
	4			8.6	1.9	2.3	1.7	0.9	1.5	1.8	3.1	1.9	1	2.3	1.6
	5			8.1	1.8	2.4	1.7	1.3	1.3	1.8	2.7	1.8	4.5	2.3	1.9
	6			7.6	1.9	2.8	1.6	1.6	1.4	1.7	3.3	1.7	5.5	2.4	4
	7			-	2.2	-	-	-	-	-	-	-	-	-	-
	8			-	2.5	-	-	-	-	-	-	-	-	-	-
J	1			-	-	-	-	2.2	-	-	-	-	-	-	-
	2			-	-	-	-	4.9	-	-	-	-	-	-	-
	3			-	-	-	-	2	-	-	-	-	-	-	-
	4			-	-	-	-	13.5	1.7	1.7	-	-	-	-	-
	5			-	-	-	-	-	1.5	-	-	-	-	-	-
	6			-	-	-	-	-	2.9	-	-	-	-	-	-
K	1			-	-	-	-	16	1.6	-	-	-	-	-	-
	2			-	-	-	-	100	-	-	-	-	-	-	-
	3			-	-	-	-	67.9	-	-	-	-	-	-	-
	4			-	-	-	-	2.7	-	-	-	-	-	-	-
	5			-	-	-	-	1.8	-	-	-	-	-	-	-
	6			-	-	-	-	1.7	-	-	-	-	-	-	-
M	1			-	-	-	-	-	5.6	-	-	-	-	-	-
	2			-	-	-	-	-	35.9	-	-	-	-	-	-
	3			-	-	-	-	-	2	-	-	-	-	-	-
	4			-	-	-	-	-	2	-	-	-	-	-	-
	5			-	-	-	-	-	1.8	-	-	-	-	-	-
	6			-	-	-	-	-	1.8	-	-	-	-	-	-

The threshold levels for further investigation and corrective action were adopted from the *Environmental Guidelines: Solid Waste Landfills* (EPA 2016)

Notes:
ppm: parts per million
"-" denotes not accessible

Transact	Unit	Level for Investigation and Corrective Action	Date										
			5/06/2017	26/07/2017	8/08/2017	7/09/2017	9/10/2017	1/11/2017	11/12/2017	10/01/2018	14/02/2018	9/03/2018	11/04/2018
EPA point 21	% v/v	1	0.0002	0.0001	0.0002	0.0002	0.0002	0.0004	0.0005	0.0001	0.0002	0.0006	0.0003
EPA point 22			0.0004	0.0001	0.0002	0.0002	0.0003	0.0001	0.0002	0.0002	0.0002	0.0006	0.0002
EPA point 23			0.0007	0.0001	0.0002	0.0001	0.0002	0	0.0002	0.0001	0.0001	0.0004	0
EPA point 24			0.0008	0.0001	0.0002	0.0002	0.0004	0.0001	0.0003	0.0002	0.0003	0.0003	0.0001
EPA point 25			0.0004	0.0002	0.0004	0.0002	0.0003	0.0003	0.0002	0.0001	0.0005	0.0006	0.0005
EPA point 26			0.0009	0.0002	0.0004	0.0002	0.0006	0.0003	0.0007	0.0006	0.0004	0.0006	0.0003
EPA point 27			0.0014	0.0006	0.0015	0.0004	0.0005	0.002	0.0006	0.0014	0.0007	0.0006	0.001
EPA point 28			0.0018	0.0005	0.0011	0.0007	0.0006	0.0004	0.0007	0.0015	0.0008	0.0002	0.0005
EPA point 29			0.0023	0.0006	0.0006	0.0003	0.0006	0.0003	0.001	0.0027	0.0003	0.0012	0.0005
EPA point 30			0.001	0.0016	0.0066	0.0005	0.0004	0.0003	0.0012	0.0001	0.0007	0.0011	0.0003
EPA point 31			0.0018	0.0003	0.0004	0.0003	0.0007	0.0009	0.0006	0.0001	0.0003	0.0009	-
EPA point 32			0.0005	0.0004	0.0004	0.0003	0.0009	0.0007	0.0005	0.0002	0.001	0.0005	-

The threshold levels for further investigation and corrective action were adopted from the *Environmental Guidelines: Solid Waste Landfills* (EPA 2016)

Notes:
% v/v: percentage as volume/volume
"-" denotes no access

Building / Structure	Location	Unit	Level for Investigation and Corrective Action	Date											
				5/06/2017	26/07/2017	8/08/2017	7/09/2017	9/10/2017	1/11/2017	11/12/2017	10/01/2018	14/02/2018	9/03/2018	11/04/2018	2/05/2018
SWERF	1	% (v/v)	1	-	-	-	-	-	0.00011	0.00017	-	-	-	-	-
	2			-	-	-	-	-	0.0001	0.00017	-	-	-	-	-
Weighbridge Office	1			0.00017	0.0001	0.00022	0.00014	0.00018	0.00011	0.0003	0.00016	0.00017	0.00016	0.00044	0.00024
Glengarry Cottage	Manager Office			0.00017	0.00012	0.00021	0.00015	0.00018	0.0001	0.00018	0.00014	0.00015	0.00013	0.00017	0.00022
	Front Office			0.00018	0.00011	0.00023	0.00016	0.00025	0.00013	0.00017	0.00014	0.00016	0.00012	0.00018	0.00023
	Meeting Room			0.00017	0.00013	0.00023	0.00015	0.00026	0.00011	0.0002	0.00018	0.00016	0.00011	0.00016	0.00021
	Operations Room			0.00015	0.00011	0.00022	0.00015	0.0003	0.00012	0.0002	0.00017	0.00016	0.00013	0.00018	0.0002
	Kitchen			0.00016	0.00012	0.00021	0.00015	0.00026	0.00009	0.00018	0.00018	0.00016	0.00016	0.00018	0.00022
	Hallway			0.00014	0.00013	0.00024	0.00016	0.00028	0.00011	0.00018	0.00019	0.00016	0.00013	0.00016	0.00023
	Store			0.00017	0.00011	0.00022	0.00015	0.00026	0.00009	0.00018	0.00017	0.00016	0.00013	0.00017	0.0002
	Gardens			0.00018	0.0001	0.00023	0.00015	0.00018	0.0002	0.0002	0.00018	0.00015	0.00015	0.00015	0.00021

The threshold levels for further investigation and corrective action were adopted from the *Environmental Guidelines: Solid Waste Landfills* (EPA 2016)

Notes:
v/v % denotes volume/volume as percentage
-' denotes no access

				EC	PAH	Metals				Inorganics																Field Parameters		
				Electrical Conductivity 1:5 soil:water	Phenolics Total	Calcium	Iron (Filtered)	Magnesium	Potassium	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Ammonia as N	Chloride	Fluoride	Nitrate (as N)	Nitrite (as N)	Nitrate & Nitrite (as N)	Sodium	TDS	TOC	TSS	Turbidity	Sulfate as SO4 - Turbidimetric (Filtered)	Dissolved Oxygen	pH (Field)	Temperature (Field)
				µS/cm	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	pH Units	oC
LOR				1	50	1	0.05	1	1	1	1	1	1	0.01	1	0.1	0.01	0.01	0.01	1	1	1	5	0.1	1	0.01	0.1	0.1
ADWG 2015 Health																**1.5**												
ANZECC 2000 Freshwater (80%)														**2.3**			**12**											
ANZECC 2000 Fresh Water (90%)														**1.43**			**8.7**											
ANZECC 2000 Fresh Water (95%)														**0.9**			**7.2**											
EPL 5862 (Point 1 only)																							**50**				**6.5 - 8.5**	
Site	**Location Code**	**Sample Date**	**Field ID**																									
Whytes Gully Stormwater	Point 1	19/02/2018	Point 1	1110	<50	13	<0.05	24	18	93	123	<1	216	0.01	223	0.5	<0.01	<0.01	<0.01	168	-	12	16	-	41	9.6	**9.7**	25.8
	Point 33	19/02/2018	Point 33	686	<50	44	0.52	21	8	270	<1	<1	270	**1.82**	54	0.2	<0.01	<0.01	<0.01	57	-	27	**76**	-	<1	2.82	7.5	22.5
	Point 34	19/02/2018	Point 34	768	<50	64	0.11	25	4	287	<1	<1	287	0.18	69	0.2	<0.01	<0.01	<0.01	47	-	5	23	-	4	3.45	7.6	23.9
Statistical Summary																												
Maximum Concentration				1110	<50	64	0.52	25	18	287	123	<1	287	1.82	223	0.5	<0.01	<0.01	<0.01	168	1140	27	942	50.9	41	9.6	9.8	25.8

	Depth
	m
LOR	0.01

Site	Location Code	Sample Date	Field ID	
Whytes Gully Groundwater	Point 20	22/08/2017	BH6 (Point 20)	1.65
		20/11/2017	BH6 (Point 20)	1.77
		19/02/2018	BH6	1.8
		22/05/2018	BH6 (Point 20)	1.77
	Point 5	22/08/2017	GABH02 (Point 5)	5.26
		20/11/2017	GABH02 (Point 5)	5.6
		19/02/2018	GABH02	5.5
		23/05/2018	GABH02 (Point 5)	5.56
	Point 9	22/08/2017	GMW102 (Point 9)	12.3
		20/11/2017	GMW102 (Point 9)	8.18
	Point 10	22/08/2017	GMW103 (Point 10)	7.7
		20/11/2017	GMW103 (Point 10)	7.69
		19/02/2018	GMW103	7.95
		22/05/2018	GMW103 (Point 10)	7.75
	Point 11	22/08/2017	GMW104 (Point 11)	7.52
		20/11/2017	GMW104 (Point 11)	7.45
		19/02/2018	GMW104	8.65
		22/05/2018	GMW104 (Point 11)	7.9
	Point 12	22/08/2017	GMW105 (Point 12)	10.8
		20/11/2017	GMW105 (Point 12)	11.7
	Point 15	22/08/2017	GMW108D (Point 15)	2.42
		20/11/2017	GMW108D (Point 15)	2.6
		19/02/2018	GMW108D	2.58
		22/05/2018	GMW108D (Point 15)	2.46
		5/06/2018	GMW108D (Point 15)	2.87
	Point 14	22/08/2017	GMW108S (Point 14)	2.91
		20/11/2017	GMW108S (Point 14)	2.98
		19/02/2018	GMW108S	3.09
		22/05/2018	GMW108S (Point 14)	2.96
	Point 19	22/08/2017	GMW109D (Point 19)	3.13
		20/11/2017	GMW109D (Point 19)	3.07
		19/02/2018	GMW109D	3.47
		22/05/2018	GMW109D (Point 19)	3.3
	Point 16	22/08/2017	GMW109S (Point 16)	3.35
		20/11/2017	GMW109S (Point 16)	2.88
		19/02/2018	GMW109S	3.93
		22/05/2018	GMW109S (Point 16)	3.59
	Point 17	22/08/2017	GMW110 (Point 17)	4.23
		20/11/2017	GMW110 (Point 17)	4.43
		19/02/2018	GMW110	4.46
		22/05/2018	GMW110 (Point 17)	4.35
	Point 18	22/08/2017	GMW111 (Point 18)	6.28
		20/11/2017	GMW111 (Point 18)	6.62
		19/02/2018	GMW111	6.62
		22/05/2018	GMW111 (Point 18)	6.55

Statistical Summary

Maximum Concentration	12.3
Average Concentration	5.1
Standard Deviation	2.7

Whytes Gully Landfill
Groundwater
Table 5B - BTEX, TRH, CRC Care TRH Fractions, PAH

				BTEX						TRH					CRC Care TRH Fractions							PAH																				
				Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	BaP TEQ (zero)	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Phenolics Total	Pyrene
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR				1	2	2	2	2	2	1	20	50	100	50	50	20	100	100	100	100	20	100	0.5	1	1	1	1	1	0.5	1	1	1	1	1	1	1	0.5	1	50	1
ADWG 2015 Health				**1**	**800**	**300**			**600**																			**0.01**												
ANZECC 2000 Freshwater (80%)				**2000**				**640**																												**85**				
ANZECC 2000 Fresh Water (90%)				**1300**				**470**																												**37**				
ANZECC 2000 Fresh Water (95%)				**950**				**350**																		**0.4**										**16**				
Site	**Location Code**	**Sample Date**	**Field ID**																																							
Whytes Gully Landfill - Groundwater	Point 20	19/02/2018	BH6 (Point 20)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 5	19/02/2018	GABH02 (Point 5)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 10	19/02/2018	GMW103 (Point 10)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 11	19/02/2018	GMW104 (Point 11)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 15	19/02/2018	GMW108D (Point 15)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 14	19/02/2018	GMW108S (Point 14)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 19	19/02/2018	GMW109D (Point 19)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 16	19/02/2018	GMW109S (Point 16)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 17	19/02/2018	GMW110 (Point 17)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
	Point 18	19/02/2018	GMW111 (Point 18)	<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1
Statistical Summary																																										
Maximum Concentration				<1	<2	<2	<2	<2	<2	<1	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<20	<100	<0.5	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<50	<1

				Metals												
				Aluminium (total)	Aluminium (dissolved)	Arsenic	Barium (total)	Barium (dissolved)	Cadmium (total)	Cadmium (dissolved)	Calcium (Filtered)	Chromium (hexavalent)	Chromium (III+VI) (total)	Chromium (III+VI) (dissolved)	Cobalt (total)	Cobalt (dissolved)
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR				0.01	0.001	0.001	0.001	0.001	0.0001	0.0001	1	0.01	0.001	0.001	0.001	0.001
ADWG 2015 Health						**0.01**	**2**	**2**	**0.002**	**0.002**		**0.05**				
ANZECC 2000 Freshwater (80%)				**0.15**	**0.15**				**0.0008**	**0.0008**		**0.04**				
ANZECC 2000 Fresh Water (90%)				**0.08**	**0.08**				**0.0004**	**0.0004**		**0.006**				
ANZECC 2000 Fresh Water (95%)				**0.055**	**0.055**				**0.0002**	**0.0002**		**0.001**				
Site	**Location Code**	**Sample Date**	**Field ID**													
Whytes Gully Landfill	Point 20	22/08/2017	BH6 (Point 20)	-	-	-	-	-	-	-	113	-	-	-	-	-
		20/11/2017	BH6 (Point 20)	-	-	-	-	-	-	-	98	-	-	-	-	-
		19/02/2018	BH6 (Point 20)	**1.12**	-	0.003	0.068	-	<0.0001	-	-	**<0.01**	0.002	-	0.015	-
		19/02/2018	BH6 (Point 20)	-	-	-	-	-	-	-	116	-	-	-	-	-
		22/05/2018	BH6 (Point 20)	-	-	-	-	-	-	-	121	-	-	-	-	-
	Point 5	22/08/2017	GABH02 (Point 5)	-	-	-	-	-	-	-	292	-	-	-	-	-
		20/11/2017	GABH02 (Point 5)	-	-	-	-	-	-	-	232	-	-	-	-	-
		19/02/2018	GABH02 (Point 5)	**4.09**	-	<0.001	0.015	-	<0.0001	-	-	**<0.01**	0.004	-	<0.001	-
		19/02/2018	GABH02 (Point 5)	-	-	-	-	-	-	-	324	-	-	-	-	-
		23/05/2018	GABH02 (Point 5)	-	-	-	-	-	-	-	304	-	-	-	-	-
	Point 9	22/08/2017	GMW102 (Point 9)	-	-	-	-	-	-	-	102	-	-	-	-	-
		20/11/2017	GMW102 (Point 9)	-	-	-	-	-	-	-	26	-	-	-	-	-
	Point 10	22/08/2017	GMW103 (Point 10)	-	-	-	-	-	-	-	197	-	-	-	-	-
		20/11/2017	GMW103 (Point 10)	-	-	-	-	-	-	-	162	-	-	-	-	-
		19/02/2018	GMW103 (Point 10)	**5.62**	-	<0.001	0.041	-	<0.0001	-	-	**<0.01**	0.009	-	0.01	-
		19/02/2018	GMW103 (Point 10)	-	-	-	-	-	-	-	173	-	-	-	-	-
		22/05/2018	GMW103 (Point 10)	-	-	-	-	-	-	-	190	-	-	-	-	-
	Point 11	22/08/2017	GMW104 (Point 11)	**35.5**	-	-	0.055	-	<0.0001	-	54	-	0.021	-	0.026	-
		20/09/2017	GMW104 (Point 11)	**229**	**0.44**	-	0.202	0.014	**0.0006**	<0.0001	-	-	0.103	<0.001	0.138	0.001
		20/11/2017	GMW104 (Point 11)	**7.7**	-	-	0.036	-	<0.0001	-	50	-	0.005	-	0.006	-
		19/02/2018	GMW104 (Point 11)	**12.5**	-	<0.001	0.044	-	<0.0001	-	-	**<0.01**	0.009	-	0.007	-
		19/02/2018	GMW104 (Point 11)	-	-	-	-	-	-	-	58	-	-	-	-	-
		22/05/2018	GMW104 (Point 11)	**7.49**	-	-	0.037	-	<0.0001	-	62	-	0.005	-	0.004	-
	Point 12	22/08/2017	GMW105 (Point 12)	-	-	-	-	-	-	-	8	-	-	-	-	-
		20/11/2017	GMW105 (Point 12)	-	-	-	-	-	-	-	7	-	-	-	-	-
	Point 15	22/08/2017	GMW108D (Point 15)	-	-	-	-	-	-	-	118	-	-	-	-	-
		20/11/2017	GMW108D (Point 15)	-	-	-	-	-	-	-	48	-	-	-	-	-
		19/02/2018	GMW108D (Point 15)	**0.39**	-	<0.001	0.022	-	<0.0001	-	-	**<0.01**	0.001	-	<0.001	-
		19/02/2018	GMW108D (Point 15)	-	-	-	-	-	-	-	119	-	-	-	-	-
		22/05/2018	GMW108D (Point 15)	-	-	-	-	-	-	-	46	-	-	-	-	-
	Point 14	22/08/2017	GMW108S (Point 14)	-	-	-	-	-	-	-	134	-	-	-	-	-
		20/11/2017	GMW108S (Point 14)	-	-	-	-	-	-	-	20	-	-	-	-	-
		19/02/2018	GMW108S (Point 14)	**19.9**	-	0.002	0.231	-	<0.0001	-	-	**<0.01**	0.017	-	0.012	-
		19/02/2018	GMW108S (Point 14)	-	-	-	-	-	-	-	126	-	-	-	-	-
		22/05/2018	GMW108S (Point 14)	-	-	-	-	-	-	-	94	-	-	-	-	-
	Point 19	22/08/2017	GMW109D (Point 19)	-	-	-	-	-	-	-	90	-	-	-	-	-
		20/11/2017	GMW109D (Point 19)	-	-	-	-	-	-	-	76	-	-	-	-	-
		19/02/2018	GMW109D (Point 19)	**0.21**	-	<0.001	0.139	-	<0.0001	-	-	**<0.01**	<0.001	-	<0.001	-
		19/02/2018	GMW109D (Point 19)	-	-	-	-	-	-	-	84	-	-	-	-	-
		22/05/2018	GMW109D (Point 19)	-	-	-	-	-	-	-	89	-	-	-	-	-
	Point 16	22/08/2017	GMW109S (Point 16)	**14.8**	-	-	0.344	-	**0.0007**	-	70	-	0.022	-	0.058	-
		20/09/2017	GMW109S (Point 16)	**13.6**	**0.42**	-	0.361	0.156	**0.0004**	<0.0001	-	-	0.018	<0.001	0.046	0.027
		20/11/2017	GMW109S (Point 16)	**3.23**	-	-	0.16	-	<0.0001	-	56	-	0.004	-	0.034	-
		19/02/2018	GMW109S (Point 16)	**6.02**	-	0.004	0.268	-	**0.0002**	-	-	**<0.01**	0.008	-	0.03	-
		19/02/2018	GMW109S (Point 16)	-	-	-	-	-	-	-	68	-	-	-	-	-
		22/05/2018	GMW109S (Point 16)	**4.76**	-	-	0.226	-	<0.0001	-	66	-	0.006	-	0.033	-
	Point 17	22/08/2017	GMW110 (Point 17)	-	-	-	-	-	-	-	195	-	-	-	-	-
		20/11/2017	GMW110 (Point 17)	-	-	-	-	-	-	-	172	-	-	-	-	-
		19/02/2018	GMW110 (Point 17)	**3.43**	-	<0.001	0.015	-	<0.0001	-	-	**<0.01**	0.003	-	0.003	-
		19/02/2018	GMW110 (Point 17)	-	-	-	-	-	-	-	216	-	-	-	-	-
		22/05/2018	GMW110 (Point 17)	-	-	-	-	-	-	-	207	-	-	-	-	-
	Point 18	22/08/2017	GMW111 (Point 18)	-	-	-	-	-	-	-	123	-	-	-	-	-
		20/11/2017	GMW111 (Point 18)	-	-	-	-	-	-	-	113	-	-	-	-	-
		19/02/2018	GMW111 (Point 18)	**4.19**	-	<0.001	0.034	-	<0.0001	-	-	**<0.01**	0.002	-	0.004	-
		19/02/2018	GMW111 (Point 18)	-	-	-	-	-	-	-	121	-	-	-	-	-
		22/05/2018	GMW111 (Point 18)	-	-	-	-	-	-	-	126	-	-	-	-	-
Statistical Summary																
Maximum Concentration				229	0.44	0.004	0.361	0.156	0.0007	<0.0001	324	<0.01	0.103	<0.001	0.138	0.027
Average Concentration				21		0.0016	0.13		0.00018		120	0.01	0.013		0.024	
Standard Deviation				53		0.0011	0.12		0.00019		76	0	0.023		0.033	

				Metals												
				Copper (total)	Copper (dissolved)	Lead (total)	Lead (dissolved)	Magnesium (Filtered)	Manganese (total)	Manganese (dissolved)	Mercury	Nickel (total)	Nickel (dissolved)	Potassium (Filtered)	Zinc (total)	Zinc (dissolved)
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR				0.001	0.001	0.001	0.001	1	0.001	0.001	0.0001	0.001	0.001	1	0.005	0.005
ADWG 2015 Health				**2**	**2**	**0.01**	**0.01**		**0.5**	**0.5**	**0.001**	**0.02**	**0.02**			
ANZECC 2000 Freshwater (80%)				**0.0025**	**0.0025**	**0.0094**	**0.0094**		**3.6**	**3.6**	**0.0054**	**0.017**	**0.017**		**0.031**	**0.031**
ANZECC 2000 Fresh Water (90%)				**0.0018**	**0.0018**	**0.0056**	**0.0056**		**2.5**	**2.5**	**0.0019**	**0.013**	**0.013**		**0.015**	**0.015**
ANZECC 2000 Fresh Water (95%)				**0.0014**	**0.0014**	**0.0034**	**0.0034**		**1.9**	**1.9**	**0.0006**	**0.011**	**0.011**		**0.008**	**0.008**
Site	**Location Code**	**Sample Date**	**Field ID**													
Whytes Gully Landfill	Point 20	22/08/2017	BH6 (Point 20)	-	-	-	-	118	-	-	-	-	-	<1	-	-
		20/11/2017	BH6 (Point 20)	-	-	-	-	115	-	-	-	-	-	<1	-	-
		19/02/2018	BH6 (Point 20)	**0.003**	**-**	**0.009**	**-**	-	**2.83**	**-**	<0.0001	-	-	-	**0.01**	**-**
		19/02/2018	BH6 (Point 20)	-	-	-	-	120	-	-	-	-	-	<1	-	-
		22/05/2018	BH6 (Point 20)	-	-	-	-	130	-	-	-	-	-	<1	-	-
	Point 5	22/08/2017	GABH02 (Point 5)	-	-	-	-	192	-	-	-	-	-	2	-	-
		20/11/2017	GABH02 (Point 5)	-	-	-	-	155	-	-	-	-	-	2	-	-
		19/02/2018	GABH02 (Point 5)	**0.008**	**-**	**0.004**	**-**	-	0.07	-	<0.0001	-	-	-	**0.027**	**-**
		19/02/2018	GABH02 (Point 5)	-	-	-	-	190	-	-	-	-	-	2	-	-
		23/05/2018	GABH02 (Point 5)	-	-	-	-	196	-	-	-	-	-	3	-	-
	Point 9	22/08/2017	GMW102 (Point 9)	-	-	-	-	31	-	-	-	-	-	<1	-	-
		20/11/2017	GMW102 (Point 9)	-	-	-	-	10	-	-	-	-	-	<1	-	-
	Point 10	22/08/2017	GMW103 (Point 10)	-	-	-	-	66	-	-	-	-	-	<1	-	-
		20/11/2017	GMW103 (Point 10)	-	-	-	-	61	-	-	-	-	-	<1	-	-
		19/02/2018	GMW103 (Point 10)	**0.016**	**-**	**0.014**	**-**	-	0.452	-	<0.0001	-	-	-	**0.035**	**-**
		19/02/2018	GMW103 (Point 10)	-	-	-	-	58	-	-	-	-	-	<1	-	-
		22/05/2018	GMW103 (Point 10)	-	-	-	-	65	-	-	-	-	-	<1	-	-
	Point 11	22/08/2017	GMW104 (Point 11)	**0.05**	**-**	**0.019**	**-**	31	**1.6**	**-**	**-**	**-**	**-**	<1	**0.104**	**-**
		20/09/2017	GMW104 (Point 11)	**0.32**	<0.001	**0.088**	<0.001	-	**7.15**	0.415	**-**	**0.088**	0.002	-	**0.61**	**<0.005**
		20/11/2017	GMW104 (Point 11)	**0.014**	**-**	**0.004**	**-**	34	0.374	-	-	-	-	<1	**0.027**	**-**
		19/02/2018	GMW104 (Point 11)	**0.016**	**-**	**0.008**	**-**	-	0.47	-	<0.0001	-	-	-	**0.045**	**-**
		19/02/2018	GMW104 (Point 11)	-	-	-	-	36	-	-	-	-	-	<1	-	-
		22/05/2018	GMW104 (Point 11)	**0.011**	**-**	**0.004**	**-**	42	0.381	-	-	-	-	<1	**0.025**	**-**
	Point 12	22/08/2017	GMW105 (Point 12)	-	-	-	-	4	-	-	-	-	-	<1	-	-
		20/11/2017	GMW105 (Point 12)	-	-	-	-	4	-	-	-	-	-	<1	-	-
	Point 15	22/08/2017	GMW108D (Point 15)	-	-	-	-	79	-	-	-	-	-	1	-	-
		20/11/2017	GMW108D (Point 15)	-	-	-	-	32	-	-	-	-	-	10	-	-
		19/02/2018	GMW108D (Point 15)	**0.002**	**-**	<0.001	-	-	0.021	-	<0.0001	-	-	-	**0.01**	**-**
		19/02/2018	GMW108D (Point 15)	-	-	-	-	78	-	-	-	-	-	1	-	-
		22/05/2018	GMW108D (Point 15)	-	-	-	-	14	-	-	-	-	-	12	-	-
	Point 14	22/08/2017	GMW108S (Point 14)	-	-	-	-	97	-	-	-	-	-	2	-	-
		20/11/2017	GMW108S (Point 14)	-	-	-	-	10	-	-	-	-	-	4	-	-
		19/02/2018	GMW108S (Point 14)	**0.042**	**-**	**0.014**	**-**	-	0.385	**-**	<0.0001	-	-	-	**0.056**	**-**
		19/02/2018	GMW108S (Point 14)	-	-	-	-	94	-	-	-	-	-	1	-	-
		22/05/2018	GMW108S (Point 14)	-	-	-	-	67	-	-	-	-	-	2	-	-
	Point 19	22/08/2017	GMW109D (Point 19)	-	-	-	-	48	-	-	-	-	-	1	-	-
		20/11/2017	GMW109D (Point 19)	-	-	-	-	45	-	-	-	-	-	1	-	-
		19/02/2018	GMW109D (Point 19)	**0.002**	**-**	0.001	-	-	**0.832**	**-**	<0.0001	-	-	-	**0.014**	**-**
		19/02/2018	GMW109D (Point 19)	-	-	-	-	45	-	-	-	-	-	1	-	-
		22/05/2018	GMW109D (Point 19)	-	-	-	-	48	-	-	-	-	-	1	-	-
	Point 16	22/08/2017	GMW109S (Point 16)	**0.067**	**-**	**0.036**	**-**	44	**3.14**	**-**	-	-	-	1	**0.163**	**-**
		20/09/2017	GMW109S (Point 16)	**0.056**	**0.003**	**0.022**	<0.001	-	**3.58**	**3.19**	-	**0.028**	0.009	-	**0.125**	**0.022**
		20/11/2017	GMW109S (Point 16)	**0.015**	**-**	**0.005**	**-**	41	**3.62**	**-**	-	-	-	2	**0.039**	**-**
		19/02/2018	GMW109S (Point 16)	**0.025**	**-**	**0.012**	**-**	-	**3.97**	**-**	<0.0001	-	-	-	**0.165**	**-**
		19/02/2018	GMW109S (Point 16)	-	-	-	-	38	-	-	-	-	-	2	-	-
		22/05/2018	GMW109S (Point 16)	**0.013**	**-**	**0.008**	**-**	41	**3.54**	**-**	-	-	-	2	**0.055**	**-**
	Point 17	22/08/2017	GMW110 (Point 17)	-	-	-	-	153	-	-	-	-	-	1	-	-
		20/11/2017	GMW110 (Point 17)	-	-	-	-	147	-	-	-	-	-	1	-	-
		19/02/2018	GMW110 (Point 17)	**0.005**	**-**	0.002	-	-	0.151	-	<0.0001	-	-	-	**0.018**	**-**
		19/02/2018	GMW110 (Point 17)	-	-	-	-	177	-	-	-	-	-	2	-	-
		22/05/2018	GMW110 (Point 17)	-	-	-	-	159	-	-	-	-	-	1	-	-
	Point 18	22/08/2017	GMW111 (Point 18)	-	-	-	-	97	-	-	-	-	-	1	-	-
		20/11/2017	GMW111 (Point 18)	-	-	-	-	103	-	-	-	-	-	1	-	-
		19/02/2018	GMW111 (Point 18)	**0.008**	**-**	**0.004**	**-**	-	0.303	-	<0.0001	-	-	-	**0.022**	**-**
		19/02/2018	GMW111 (Point 18)	-	-	-	-	98	-	-	-	-	-	<1	-	-
		22/05/2018	GMW111 (Point 18)	-	-	-	-	104	-	-	-	-	-	1	-	-
Statistical Summary																
Maximum Concentration				0.32	0.003	0.088	<0.001	196	7.15	3.19	<0.0001	0.088	0.009	12	0.61	0.022
Average Concentration				0.037		0.014		80	1.8		0.0001			1.8	0.086	
Standard Deviation				0.073		0.02		55	2		0			2.1	0.14	

				Inorganics														
				Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Ammonia as N	Chloride	Fluoride	Nitrate (as N)	Nitrite (as N)	Nitrate & Nitrite (as N)	Sodium (Filtered)	TDS	TOC	Sulfate as SO4 - Turbidimetric (Filtered)
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR				1	1	1	1	0.01	1	0.1	0.01	0.01	0.01	1	10	1	1
ADWG 2015 Health										**1.5**							
ANZECC 2000 Freshwater (80%)								**2.3**			**12**						
ANZECC 2000 Fresh Water (90%)								**1.43**			**8.7**						
ANZECC 2000 Fresh Water (95%)								**0.9**			**7.2**						
Site	**Location Code**	**Sample Date**	**Field ID**														
Whytes Gully Landfill	Point 20	22/08/2017	BH6 (Point 20)	701	<1	<1	701	0.25	1030	-	-	-	-	747	2810	11	213
		20/11/2017	BH6 (Point 20)	658	<1	<1	658	0.28	1000	-	-	-	-	845	2600	9	251
		19/02/2018	BH6 (Point 20)	-	-	-	-	-	-	0.9	0.04	<0.01	0.04	-	-	-	-
		19/02/2018	BH6 (Point 20)	785	<1	<1	785	0.25	1150	-	-	-	-	866	2930	-	275
		22/05/2018	BH6 (Point 20)	799	<1	<1	799	0.24	1200	-	-	-	-	792	2960	9	281
	Point 5	22/08/2017	GABH02 (Point 5)	1120	<1	<1	1120	<0.01	1080	-	-	-	-	615	2960	6	147
		20/11/2017	GABH02 (Point 5)	1100	<1	<1	1100	0.03	1040	-	-	-	-	543	3030	8	164
		19/02/2018	GABH02 (Point 5)	-	-	-	-	-	-	0.5	0.02	<0.01	0.02	-	-	-	-
		19/02/2018	GABH02 (Point 5)	1160	<1	<1	1160	0.03	1170	-	-	-	-	696	3400	6	176
		23/05/2018	GABH02 (Point 5)	1210	<1	<1	1210	0.04	1140	-	-	-	-	619	3490	-	177
	Point 9	22/08/2017	GMW102 (Point 9)	358	<1	<1	358	0.08	44	-	-	-	-	40	670	3	30
		20/11/2017	GMW102 (Point 9)	113	<1	<1	113	0.02	26	-	-	-	-	28	342	2	12
	Point 10	22/08/2017	GMW103 (Point 10)	180	<1	<1	180	0.03	389	-	-	-	-	173	1380	1	122
		20/11/2017	GMW103 (Point 10)	300	<1	<1	300	0.04	414	-	-	-	-	180	1280	1	134
		19/02/2018	GMW103 (Point 10)	-	-	-	-	-	-	0.4	0.1	<0.01	0.1	-	-	-	-
		19/02/2018	GMW103 (Point 10)	450	<1	<1	450	0.08	454	-	-	-	-	177	1240	3	137
		22/05/2018	GMW103 (Point 10)	438	<1	<1	438	0.03	455	-	-	-	-	172	1400	2	151
	Point 11	22/08/2017	GMW104 (Point 11)	349	<1	<1	349	0.02	78	-	-	-	-	140	578	2	46
		20/11/2017	GMW104 (Point 11)	476	<1	<1	476	0.03	114	-	-	-	-	183	718	2	72
		19/02/2018	GMW104 (Point 11)	-	-	-	-	-	-	0.7	0.02	<0.01	0.02	-	-	-	-
		19/02/2018	GMW104 (Point 11)	504	<1	<1	504	0.03	131	-	-	-	-	177	720	2	70
		22/05/2018	GMW104 (Point 11)	500	<1	<1	500	0.04	122	-	-	-	-	180	766	2	76
	Point 12	22/08/2017	GMW105 (Point 12)	34	<1	<1	34	0.02	50	-	-	-	-	36	217	2	14
		20/11/2017	GMW105 (Point 12)	34	<1	<1	34	0.1	39	-	-	-	-	41	217	6	14
	Point 15	22/08/2017	GMW108D (Point 15)	495	<1	<1	495	0.02	600	-	-	-	-	401	1720	3	162
		20/11/2017	GMW108D (Point 15)	255	<1	<1	255	0.14	244	-	-	-	-	178	780	12	76
		19/02/2018	GMW108D (Point 15)	-	-	-	-	-	-	0.6	0.17	<0.01	0.17	-	-	-	-
		19/02/2018	GMW108D (Point 15)	514	<1	<1	514	0.02	663	-	-	-	-	439	1660	2	177
		22/05/2018	GMW108D (Point 15)	223	<1	<1	223	0.11	49	-	-	-	-	40	348	16	18
		5/06/2018	GMW108D (Point 15)	505	<1	<1	505	0.06	706	-	-	-	-	431	1590	2	199
	Point 14	22/08/2017	GMW108S (Point 14)	498	<1	<1	498	0.08	584	-	-	-	-	372	1810	4	162
		20/11/2017	GMW108S (Point 14)	144	<1	<1	144	0.04	42	-	-	-	-	61	382	13	25
		19/02/2018	GMW108S (Point 14)	-	-	-	-	-	-	0.5	0.01	<0.01	0.01	-	-	-	-
		19/02/2018	GMW108S (Point 14)	534	<1	<1	534	0.07	679	-	-	-	-	439	1730	8	191
		22/05/2018	GMW108S (Point 14)	434	<1	<1	434	0.1	496	-	-	-	-	298	1280	8	142
	Point 19	22/08/2017	GMW109D (Point 19)	209	<1	<1	209	0.08	416	-	-	-	-	188	868	<1	23
		20/11/2017	GMW109D (Point 19)	215	<1	<1	215	0.08	413	-	-	-	-	206	929	<1	23
		19/02/2018	GMW109D (Point 19)	-	-	-	-	-	-	0.4	0.11	<0.01	0.11	-	-	-	-
		19/02/2018	GMW109D (Point 19)	243	<1	<1	243	0.02	461	-	-	-	-	198	1080	<1	25
		22/05/2018	GMW109D (Point 19)	242	<1	<1	242	0.05	480	-	-	-	-	185	1000	<1	26
	Point 16	22/08/2017	GMW109S (Point 16)	215	<1	<1	215	0.38	282	-	-	-	-	153	912	7	84
		20/11/2017	GMW109S (Point 16)	238	<1	<1	238	0.39	272	-	-	-	-	162	721	7	95
		19/02/2018	GMW109S (Point 16)	-	-	-	-	-	-	0.1	0.03	<0.01	0.03	-	-	-	-
		19/02/2018	GMW109S (Point 16)	304	<1	<1	304	0.82	268	-	-	-	-	162	810	10	74
		22/05/2018	GMW109S (Point 16)	266	<1	<1	266	0.81	288	-	-	-	-	142	757	6	95
	Point 17	22/08/2017	GMW110 (Point 17)	579	<1	<1	579	<0.01	853	-	-	-	-	460	2120	2	282
		20/11/2017	GMW110 (Point 17)	564	<1	<1	564	0.02	822	-	-	-	-	505	2680	2	308
		19/02/2018	GMW110 (Point 17)	-	-	-	-	-	-	0.4	0.52	<0.01	0.52	-	-	-	-
		19/02/2018	GMW110 (Point 17)	628	<1	<1	628	0.02	939	-	-	-	-	511	2470	3	317
		22/05/2018	GMW110 (Point 17)	624	<1	<1	624	0.01	988	-	-	-	-	460	2690	2	338
	Point 18	22/08/2017	GMW111 (Point 18)	527	<1	<1	527	<0.01	671	-	-	-	-	422	1750	<1	196
		20/11/2017	GMW111 (Point 18)	557	<1	<1	557	0.02	672	-	-	-	-	504	2090	2	257
		19/02/2018	GMW111 (Point 18)	-	-	-	-	-	-	0.4	0.02	<0.01	0.02	-	-	-	-
		19/02/2018	GMW111 (Point 18)	575	<1	<1	575	0.05	714	-	-	-	-	477	1810	2	205
		22/05/2018	GMW111 (Point 18)	558	<1	<1	558	0.02	739	-	-	-	-	433	1750	1	205
Statistical Summary																	
Maximum Concentration				1210	<1	<1	1210	0.82	1200	0.9	0.52	<0.01	0.52	866	3490	16	338
Average Concentration				476	<1	<1	476	0.11	544	0.5	0.1	<0.01	0.1	335	1543	5	139
Standard Deviation				283	0	0	283	0.18	368	0.2	0.16	0	0.16	234	934	4	94

				Organochlorine Pesticides																								
				4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2
ADWG 2015 Health							**0.3**		**2**					**9**									**10**	**0.3**			
ANZECC 2000 Freshwater (80%)									**0.27**					**0.04**						**0.06**			**1**	**0.7**			
ANZECC 2000 Fresh Water (90%)									**0.14**					**0.02**						**0.04**			**0.4**	**0.25**			
ANZECC 2000 Fresh Water (95%)									**0.08**					**0.01**						**0.02**			**0.2**	**0.09**			
Site	**Location Code**	**Sample Date**	**Field ID**																									
Whytes Gully Landfill	Point 20	19/02/2018	BH6 (Point 20)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 5	19/02/2018	GABH02 (Point 5)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 10	19/02/2018	GMW103 (Point 10)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 11	19/02/2018	GMW104 (Point 11)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 15	19/02/2018	GMW108D (Point 15)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 14	19/02/2018	GMW108S (Point 14)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 19	19/02/2018	GMW109D (Point 19)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 16	19/02/2018	GMW109S (Point 16)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 17	19/02/2018	GMW110 (Point 17)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
	Point 18	19/02/2018	GMW111 (Point 18)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Statistical Summary																												
Maximum Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Average Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Standard Deviation				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

				Organophosphorous Pesticides															Pesticides			
				Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Prothiofos	Demeton-S-methyl	Fenamiphos	Parathion	Pirimphos-ethyl
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	0.5	0.5	0.5	2	0.5
ADWG 2015 Health				**30**	**10**	**0.5**	**2**	**10**		**4**	**5**	**7**	**4**	**7**	**70**	**0.7**	**2**			**0.5**	**20**	**0.5**
ANZECC 2000 Freshwater (80%)				**0.11**				**1.2**		**2**		**0.3**			**1.1**						**0.04**	
ANZECC 2000 Fresh Water (90%)				**0.05**				**0.11**		**0.2**		**0.2**			**0.2**						**0.01**	
ANZECC 2000 Fresh Water (95%)				**0.02**				**0.01**		**0.01**		**0.15**			**0.05**						**0.004**	
Site	**Location Code**	**Sample Date**	**Field ID**																			
Whytes Gully Landfill	Point 20	19/02/2018	BH6 (Point 20)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 5	19/02/2018	GABH02 (Point 5)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 10	19/02/2018	GMW103 (Point 10)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 11	19/02/2018	GMW104 (Point 11)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 15	19/02/2018	GMW108D (Point 15)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 14	19/02/2018	GMW108S (Point 14)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 19	19/02/2018	GMW109D (Point 19)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 16	19/02/2018	GMW109S (Point 16)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 17	19/02/2018	GMW110 (Point 17)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
	Point 18	19/02/2018	GMW111 (Point 18)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
Statistical Summary																						
Maximum Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
Average Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5
Standard Deviation				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

				EC	TOC	pH
				Electrical Conductivity 1:5 soil:water	Nonpurgeable Organic Carbon	pH (Field)
				µS/cm	mg/L	pH Units
LOR				1	1	0.1
Site	**Location Code**	**Sample Date**	**Field ID**			
Whytes Gully Landfill	Point 20	22/08/2017	BH6 (Point 20)	4780	-	7
		20/11/2017	BH6 (Point 20)	5050	-	6.8
		19/02/2018	BH6 (Point 20)	5190	9	6.8
		22/05/2018	BH6 (Point 20)	5050	-	6.9
	Point 5	22/08/2017	GABH02 (Point 5)	5420	-	6.6
		20/11/2017	GABH02 (Point 5)	5500	-	6.8
		19/02/2018	GABH02 (Point 5)	5730	-	6.8
		23/05/2018	GABH02 (Point 5)	5330	8	6.5
	Point 9	22/08/2017	GMW102 (Point 9)	788	-	7.1
		20/11/2017	GMW102 (Point 9)	354	-	6.8
	Point 10	22/08/2017	GMW103 (Point 10)	2130	-	7
		20/11/2017	GMW103 (Point 10)	2200	-	7.2
		19/02/2018	GMW103 (Point 10)	2290	-	7.1
		22/05/2018	GMW103 (Point 10)	2250	-	7
	Point 11	22/08/2017	GMW104 (Point 11)	1060	-	7.3
		20/11/2017	GMW104 (Point 11)	1340	-	7.3
		19/02/2018	GMW104 (Point 11)	1410	-	7.5
		22/05/2018	GMW104 (Point 11)	1340	-	7.2
	Point 12	22/08/2017	GMW105 (Point 12)	276	-	5.8
		20/11/2017	GMW105 (Point 12)	278	-	5.8
	Point 15	22/08/2017	GMW108D (Point 15)	2960	-	7
		20/11/2017	GMW108D (Point 15)	1340	-	7.3
		19/02/2018	GMW108D (Point 15)	3230	-	7.2
		22/05/2018	GMW108D (Point 15)	568	-	7.3
		5/06/2018	GMW108D (Point 15)	3120	-	6.8
	Point 14	22/08/2017	GMW108S (Point 14)	2910	-	6.8
		20/11/2017	GMW108S (Point 14)	479	-	7.1
		19/02/2018	GMW108S (Point 14)	3370	-	7
		22/05/2018	GMW108S (Point 14)	2320	-	6.8
	Point 19	22/08/2017	GMW109D (Point 19)	1750	-	7
		20/11/2017	GMW109D (Point 19)	1800	-	7
		19/02/2018	GMW109D (Point 19)	1830	-	7.1
		22/05/2018	GMW109D (Point 19)	1830	-	6.9
	Point 16	22/08/2017	GMW109S (Point 16)	1420	-	6.2
		20/11/2017	GMW109S (Point 16)	1430	-	6.2
		19/02/2018	GMW109S (Point 16)	1490	-	6.5
		22/05/2018	GMW109S (Point 16)	1460	-	6.4
	Point 17	22/08/2017	GMW110 (Point 17)	4180	-	6.8
		20/11/2017	GMW110 (Point 17)	4230	-	6.7
		19/02/2018	GMW110 (Point 17)	4460	-	6.9
		22/05/2018	GMW110 (Point 17)	4370	-	6.7
	Point 18	22/08/2017	GMW111 (Point 18)	3400	-	7.4
		20/11/2017	GMW111 (Point 18)	3550	-	6.8
		19/02/2018	GMW111 (Point 18)	3560	-	7
		22/05/2018	GMW111 (Point 18)	3390	-	7

Statistical Summary

Maximum Concentration	5730	9	7.5
Average Concentration	2716		6.9
Standard Deviation	1635		0.37

Parameter	Unit	Trade Waste Agreement Criteria	Date																	
			7/06/2017	26/06/2017	17/07/2017	8/08/2017	31/08/2017	21/09/2017	13/10/2017	2/11/2017	2/11/2017	27/11/2017	22/12/2017	12/01/2018	29/01/2018	23/02/2018	16/03/2018	10/04/2018	3/05/2018	29/05/2018
Meter Reading (start)	Litres	-	243487	246497	247389	252294	253202	253855	254858	255710	255710	258630	263220	264149	266100	267416	272079	275982	277867	280810
Meter Reading (finish)	Litres	-	243949	246529	247467	252306	253242	253905	254892	255837	255837	258829	263242	264251	266164	267483	272210	276030	277919	280873
Volume Dishcharged	KL	605	462	32	78	12	41	50	34	127	127	199	23	102	100	67	131	48	52	63
Discrete Start pH (start) composite	pH Unit	7 to 10	8.2	10	6.5	7.7	8.2	8	8	8.3	8.3	7.1	8.2	8.1	7.9	8	7.9	8.4	8.2	8.5
Total Dissolved Solids composite	mg/L	10000	4170	4300	4980	5400	5640	7150	7670	8450	8450	6360	6560	6360	6360	7340	5490	5180	6120	6160
Total Dissolved Solids MDM	kg/day	2500	1926.5	137.6	388.4	64.8	231.2	357.5	260.8	1073.2	1073.2	1265.6	150.9	648.7	636.0	491.8	719.2	248.6	318.2	388.1
Suspended Solids composite	mg/L	600	36	36	68	56	77	124	62	44	44	132	162	256	68	76	79	22	28	34
Suspended Solids MDM	kg/day	150	16.6	1.2	5.3	0.7	3.2	6.2	2.1	5.6	5.6	26.3	3.7	26.1	6.8	5.1	10.3	1.1	1.5	2.1
Ammonia as N composite	mg/L	100	46	37.8	26.3	73.5	64.1	17	7	0.1	0.1	0.1	0.1	0.1	0.9	0.1	0.1	0.1	0.1	0.6
Ammonia as N MDM	kg/day	36	21.3	1.2	2.1	0.9	2.6	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
pH Finish composite	pH Unit	7 to 10	8.5	10	6.5	8.8	8.2	7.6	8	8.1	8.1	7.3	8	7.9	8.4	8	8	8.4	8.2	8.6
Biochemical Oxygen Demand	mg/L	-	63	19	41	54	86	161	72	6430	13	7	7	2	14	12	6	12	15	27
Biochemical Oxygen Demand MDM	kg/day	80	29.1	0.6	3.2	0.6	3.5	8.1	2.4	816.6	1.7	1.4	0.2	0.2	1.4	0.8	0.8	0.6	0.8	1.7
Temperature	˚C	<38	16	13	8	11	14	17	20	20	20	26	26	24	31	24	26	23	16	17
Electrical Conductivity @ 25C	µS/cm		6420	6620	7670	8310	8670	11000	11800	13000	13000	9780	10100	9780	9790	11300	8440	7970	9420	9480

Notes:
KL: Kilolitres
mg/L: milograms per litre
kg/day: kilograms per day
µS/cm: microsiemens per centimeter
MDM: maximum daily mass

APPENDIX C

QUALITY ASSURANCE AND QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) procedures were implemented to ensure the precision accuracy, representativeness, completeness and comparability of all data gathered. The QA/QC procedures included:

- Equipment calibration to ensure field measurements obtained are accurate;
- Equipment decontamination to prevent cross contamination;
- The completion of a field form for each monitoring point;
- Use of appropriate measures (i.e. gloves) to prevent cross contamination;
- Appropriate sample identification;
- Correct sample preservation;
- Sample transport with Chain of Custody (CoC) documentation; and
- Laboratory analysis in accordance with NATA accredited methods.

Table C-1 details the QA/QC procedures and sample collection details undertaken during monitoring and sample collection. **Table C-2** summarises the number of QA/QC samples collected during this investigation. CoC, Sample Receipt Notifications (SRNs), laboratory certificates and Interpretive QA/QC Reports can be provided upon request. These documents are typically appended to the report but due to the quantity of documents they have been omitted.

Table C1: Field QAQC Method Validation

Requirement	Yes/No	Comments
Equipment calibration	Yes	Each field instrument was calibrated prior to use. Calibration certificates can be provided by ALS Environmental upon request.
Equipment decontamination	Yes	Decontamination of sampling equipment (interface probe) was undertaken by washing with phosphate free detergent (Decon 90) followed by a rinse with potable water.
Sampling and monitoring documentation	Yes	Water sampling and gas monitoring was documented by ALS Environmental during each sampling event. Copies of sampling and monitoring documentation can be provided upon request.
Sample collection	Yes	Samples were collected using laboratory provided sampling containers and a clean pair of gloves was used for each new sampling point to limit the potential for cross-contamination.
Sample identification	Yes	All samples were marked with a unique identifier including the sampling point and date.
Sample preservation	Yes	Following collection water samples were placed in an esky that contained bricks. Samples were kept chilled from sample collection until laboratory receipt.
COC documentation	Yes	A COC form was completed by ALS Environmental detailing the sample identification, collection date, sampler and laboratory analysis required. COC forms and SRN can be provided upon request. The SRN indicates that the samples were received at the laboratory intact and chilled and within the required holding times.
NATA accredited methods	Yes	ALS Environmental are a NATA accredited laboratory for the required analysis, which was completed in accordance with NATA accredited methods.

Laboratory QC and QCI Report Summary

The laboratory selected to undertake laboratory testing, ALS Environmental, is NATA accredited for the analysis required. ALS Environmental undertook internal QA/QC measures to demonstrate the suitability of the data. The laboratory is required to undertake and report internal laboratory Quality Control procedures for all chemical analysis undertaken, including:

- Laboratory duplicate sample analysis at the rate of one duplicate analysis per ten samples;
- Method blank at the rate of one method blank analysis per 20 samples;
- Laboratory control sample at the rate of one laboratory control sample analysis per 20 samples; and

> Spike recovery analysis at the rate of one spike recovery analysis per 20 samples.

Compliance with the internal laboratory QA/QC requirements is provided within the QC and QCI reports provided by ALS Environmental, which can be provided upon request and are discussed below.

The QC and QCI reports received from ALS Environmental highlight outliers of QA/QC standards including holding time breaches and internal QC results. Review of the QC and QCI documentation provided by ALS Environmental indicates that several outliers existed which are summarised below in **Table C-2**.

Table C-2: Laboratory QA/QC Outlier Summary

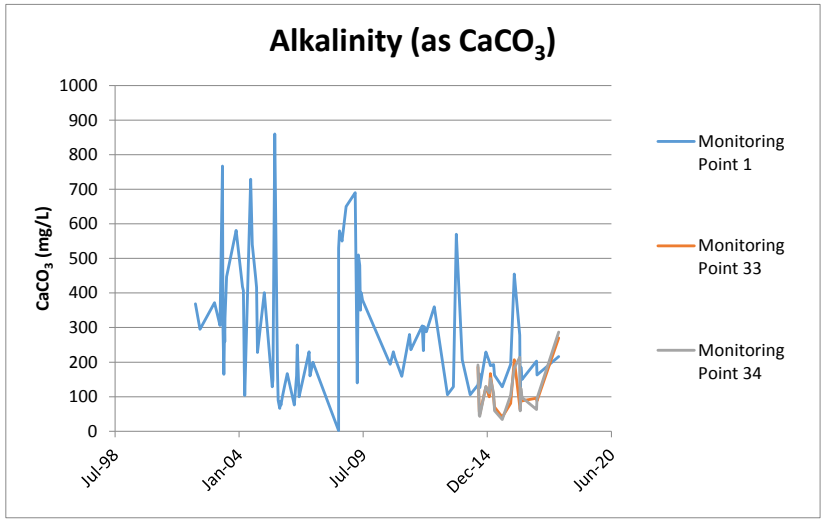
QA/QC Measure	QC Sample ID	Lab Report	Analyte
Duplicates	QC 0 Regular 12	EW1800650_1_QCI	PAH/Phenols (GC/MS – SIM)
	QC 0 Regular 10	EW1800650_1_QCI	Pesticides by GCMS
	QC 0 Regular 14	EW1800650_1_QCI	TRH – Semivolotile Fraction
Laboratory control samples	QC 2 Regular 28	EW1703553_1_QCI	Alkalinity by PC Titrator
	QC 2 Regular 26	EW1704789_1_QCI	
	QC1 Regular 16	EW1800651_1_QCI	
	QC1 Regular 14	EW1800652_1_QCI	
Matrix spikes	QC0 Regular 8	EW1800651_1_QCI	Dissolved Metals by ICP-MS – Suite A
	QC 0 Regular 12	EW1800650_1_QCI	PAH/Phenols (GC/MS – SIM)
	QC 0 Regular 10	EW1800650_1_QCI	Pesticides by GCMS
	QC 0 Regular 14	EW1800650_1_QCI	TRH – Semivolotile Fraction
Matrix Spike (MS) Recoveries	ES1720845-002	EW1703553_1_QCI	Sulfate as SO4, Chloride
	ES1721000-006	EW1703553_1_QCI	Ammonia as N
	ES1729130-004	EW1704789_1_QCI	Sulfate as SO4
	EW1800651-001	EW1800651_1_QCI	Sulfate as SO4
	EW1800651-001	EW1800652_1_QCI	Sulfate as SO4

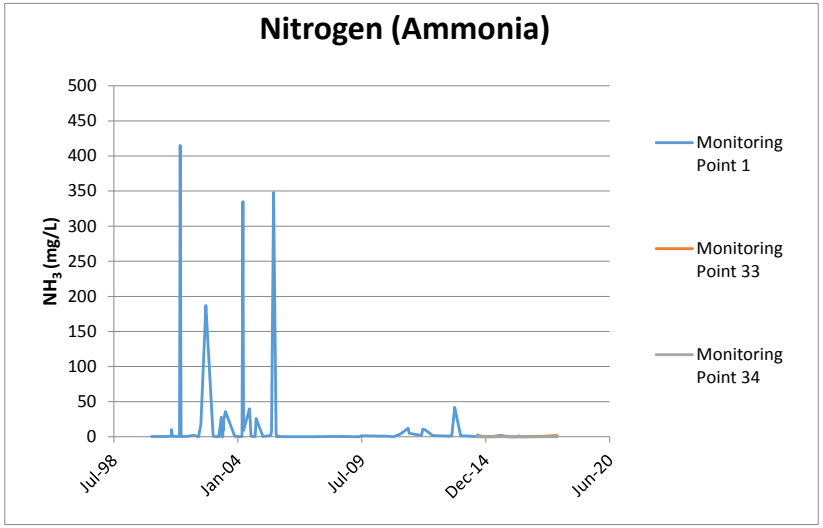
Cardno concludes that the data reported by ALS Environmental as presented in this Annual Report is suitable for interpretative to assess the environmental performance and compliance with EPL 5862.

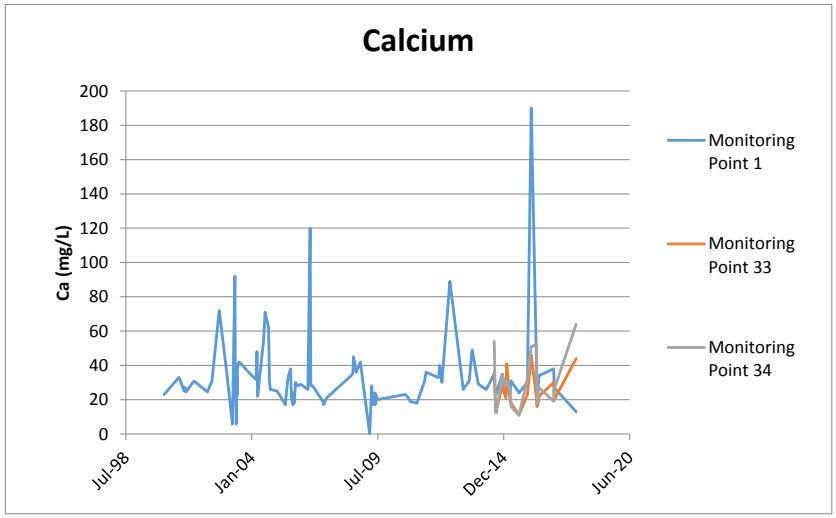
APPENDIX D

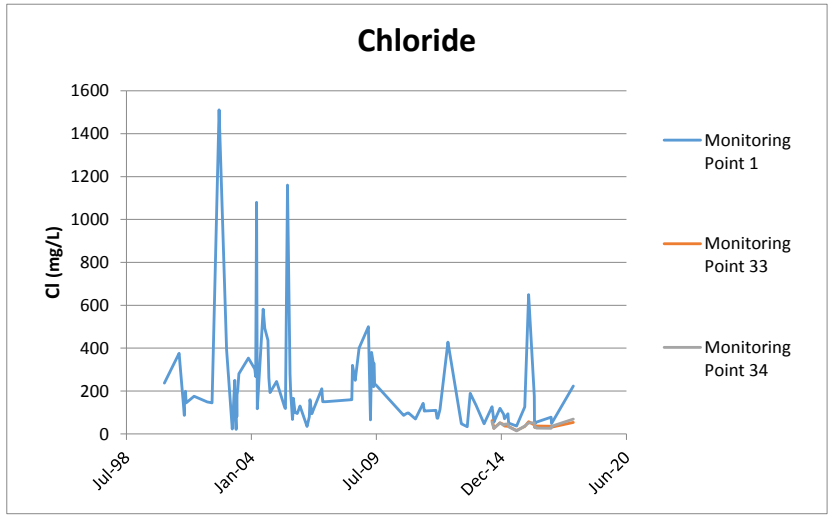
TREND GRAPHS

Sheet 1A

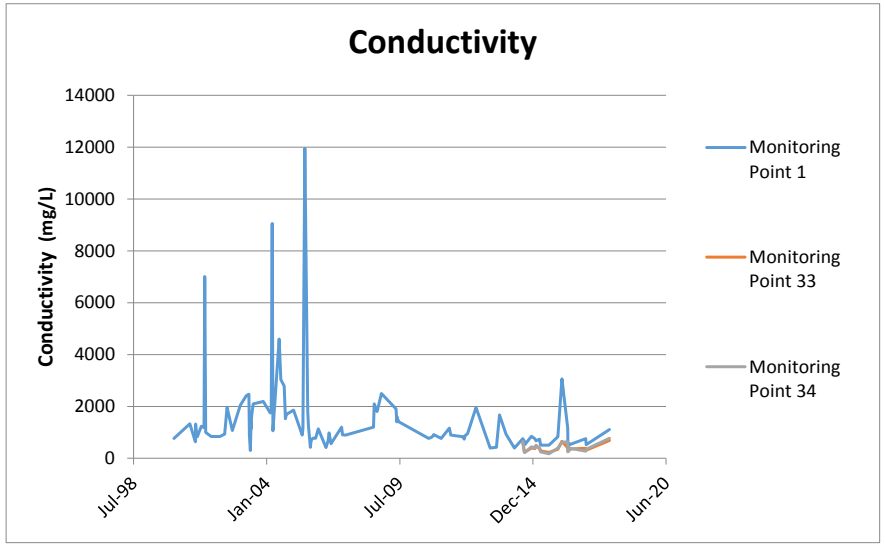

Alkalinity (as $CaCO_3$)
$CaCO_3$ (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

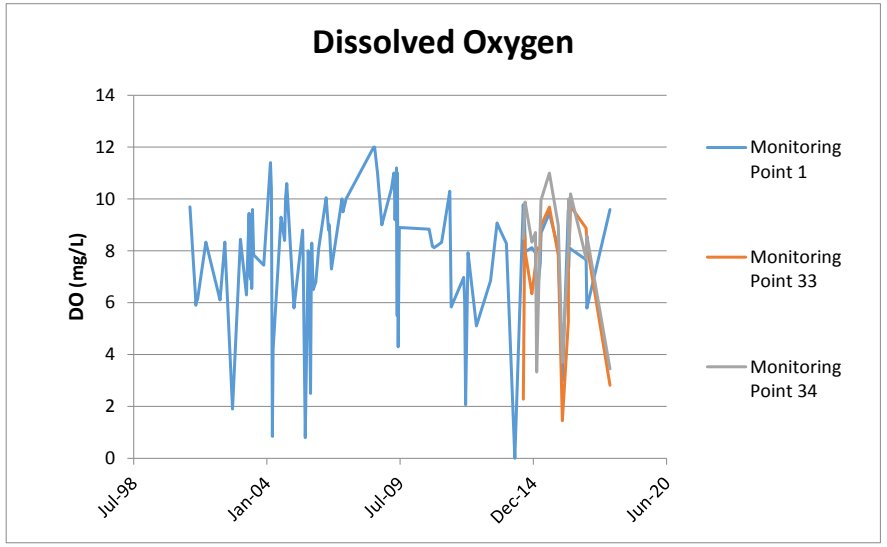

Nitrogen (Ammonia)
NH_3 (mg/L)
500
450
400
350
300
250
200
150
100
50
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

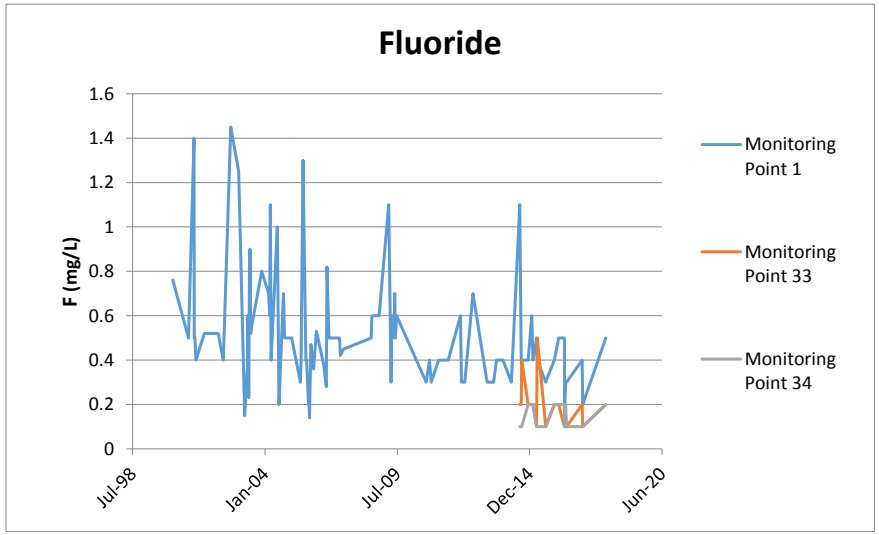

Calcium
Ca (mg/L)
200
180
160
140
120
100
80
60
40
20
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

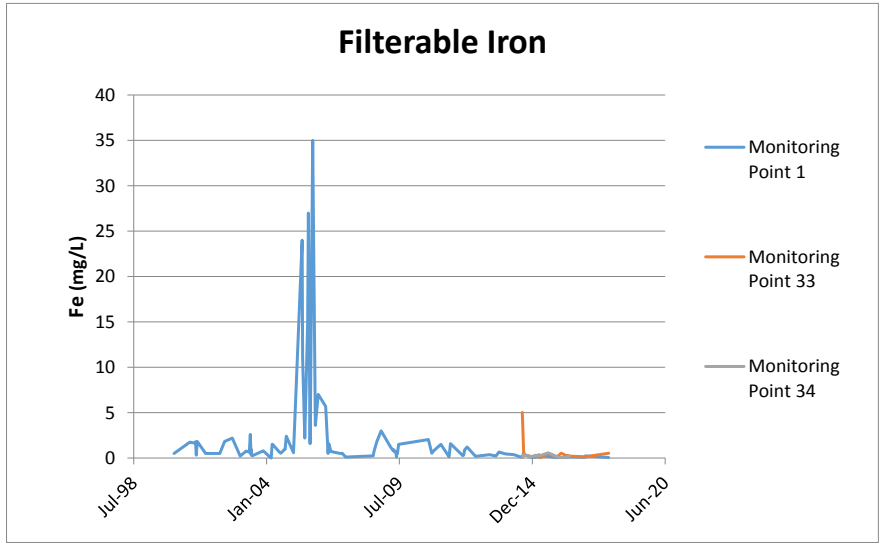

Chloride
Cl (mg/L)
1600
1400
1200
1000
800
600
400
200
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

Sheet 1B

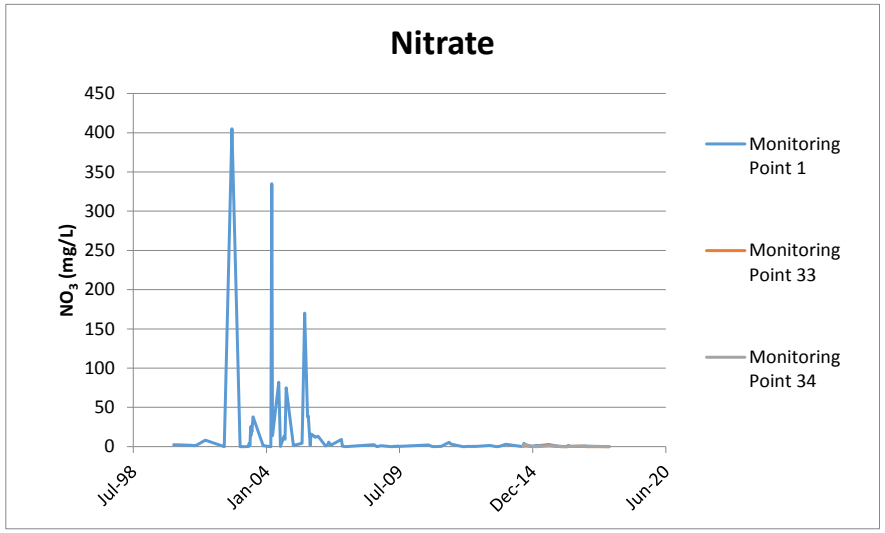

Conductivity
Conductivity (mg/L)
14000
12000
10000
8000
6000
4000
2000
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

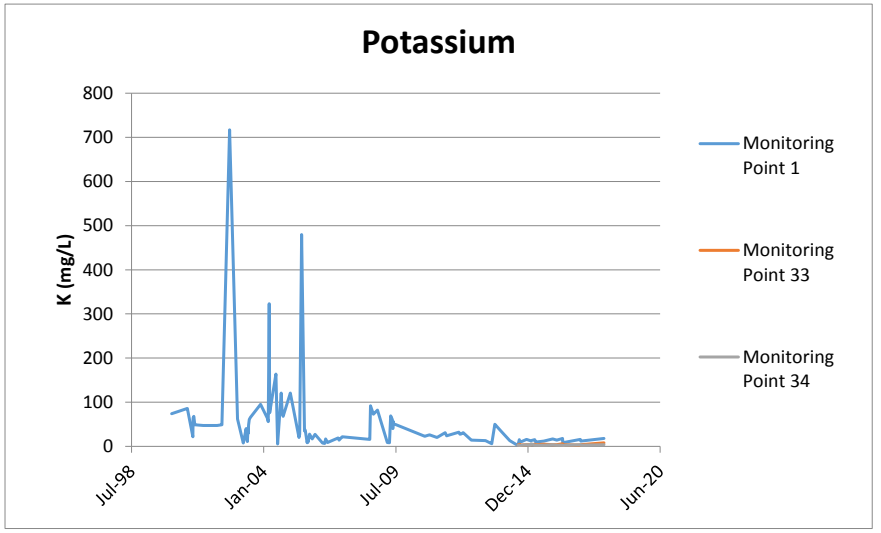

Dissolved Oxygen
DO (mg/L)
14
12
10
8
6
4
2
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

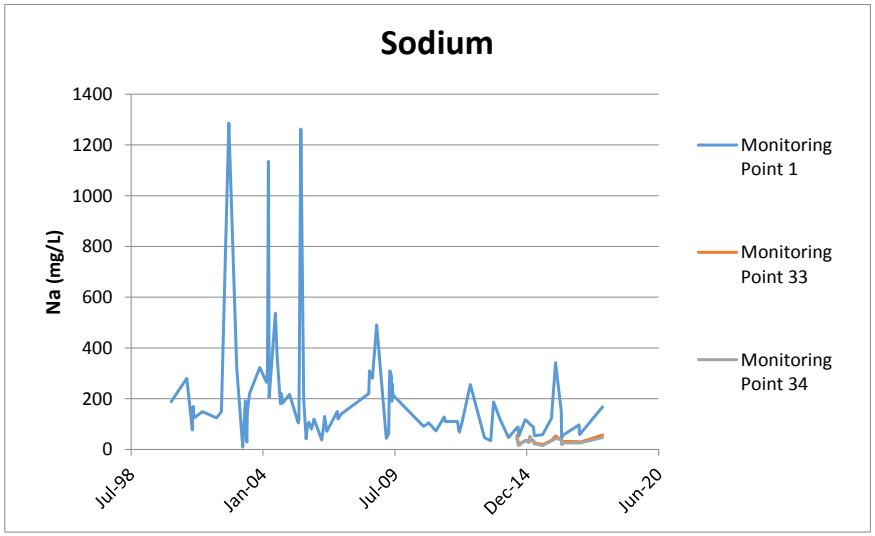

Fluoride
F (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

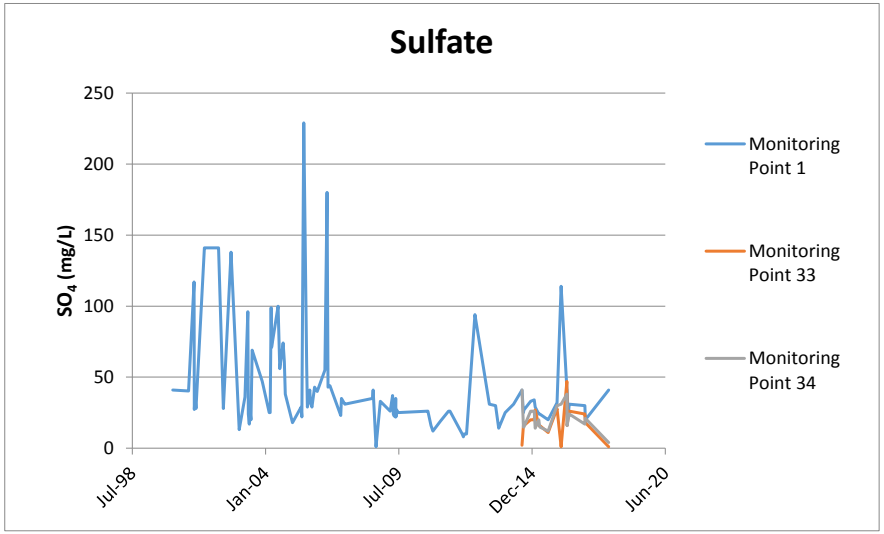

Filterable Iron
Fe (mg/L)
40
35
30
25
20
15
10
5
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

Sheet 1C

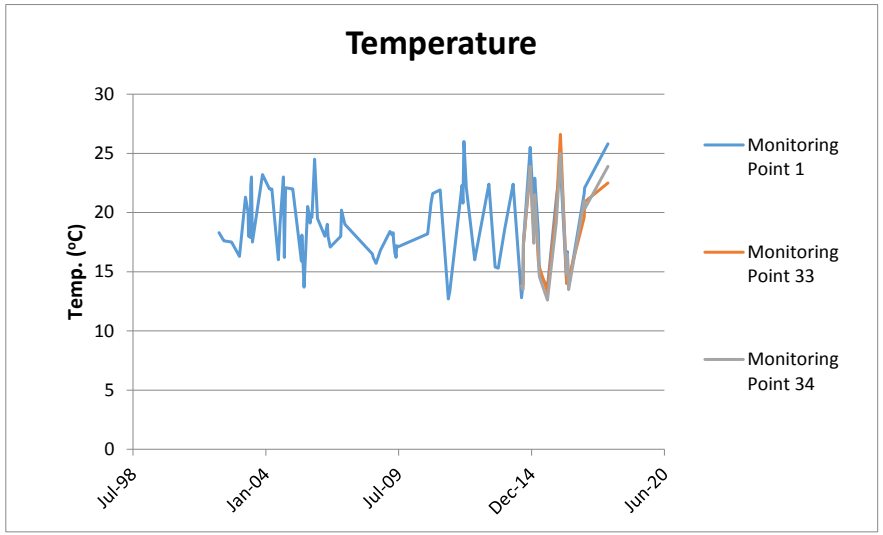

Nitrate
NO3 (mg/L)
450
400
350
300
250
200
150
100
50
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

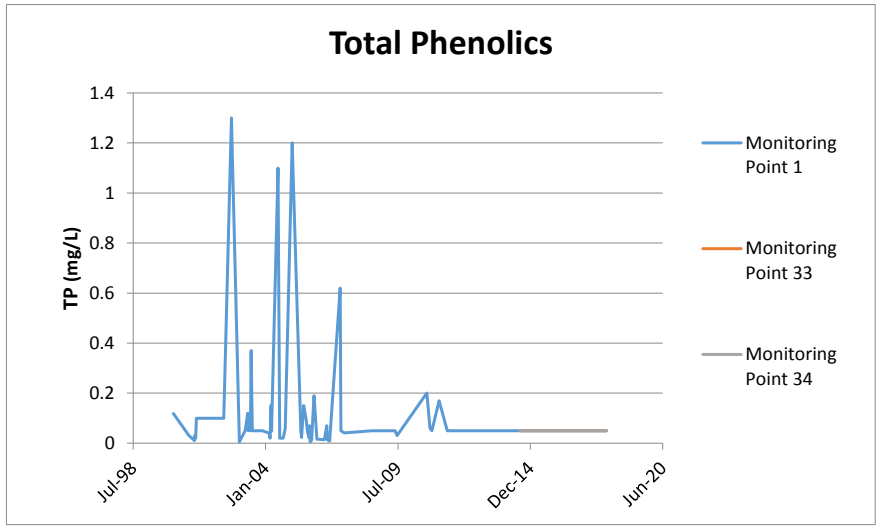

Potassium
K (mg/L)
800
700
600
500
400
300
200
100
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

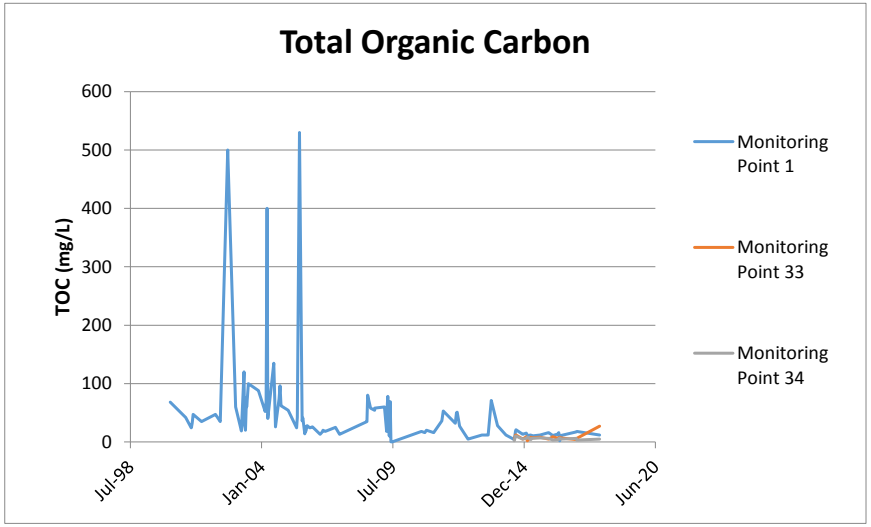

Sodium
Na (mg/L)
1400
1200
1000
800
600
400
200
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

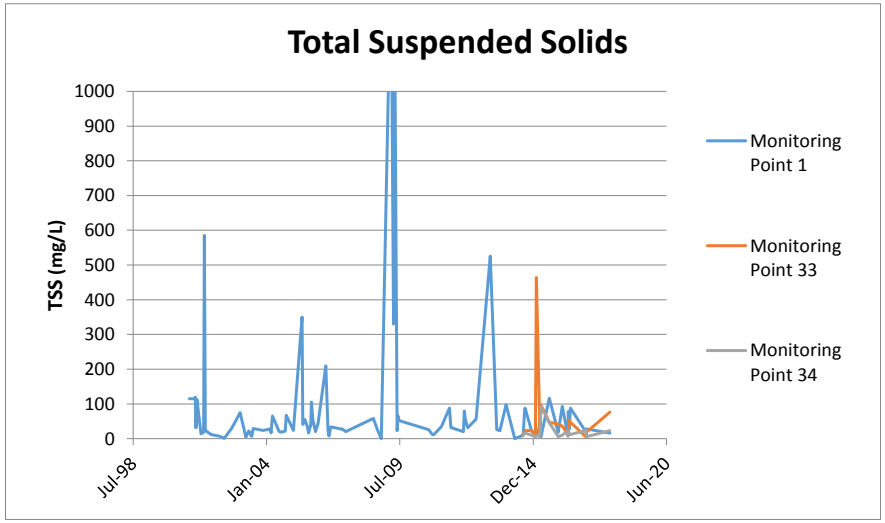

Sulfate
SO4 (mg/L)
250
200
150
100
50
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

Sheet 1D

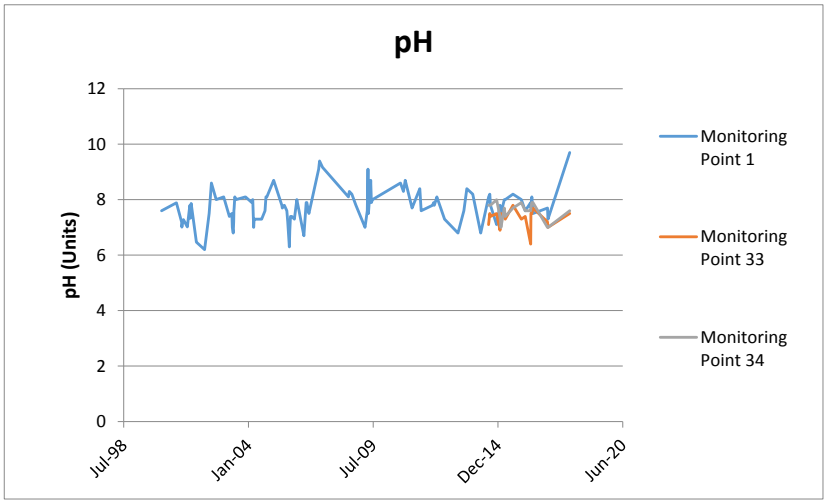

Temperature
Temp. (°C)
30
25
20
15
10
5
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

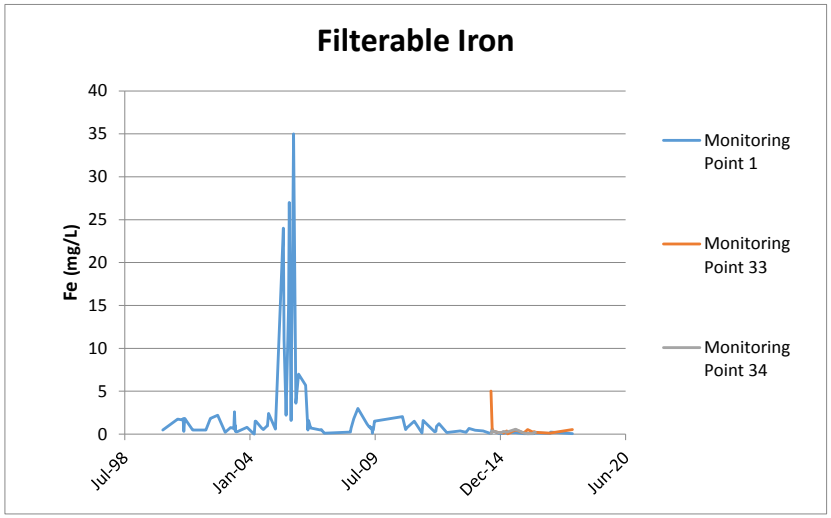

Total Phenolics
TP (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

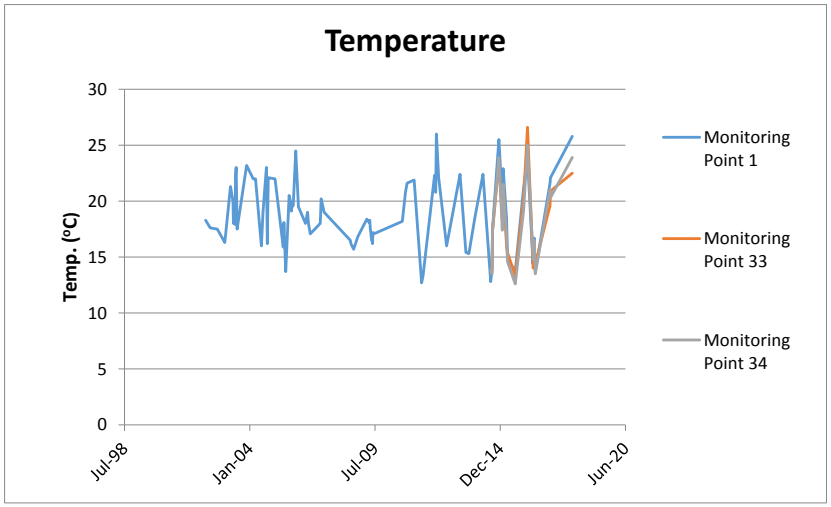

Total Organic Carbon
TOC (mg/L)
600
500
400
300
200
100
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34


Total Suspended Solids
TSS (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

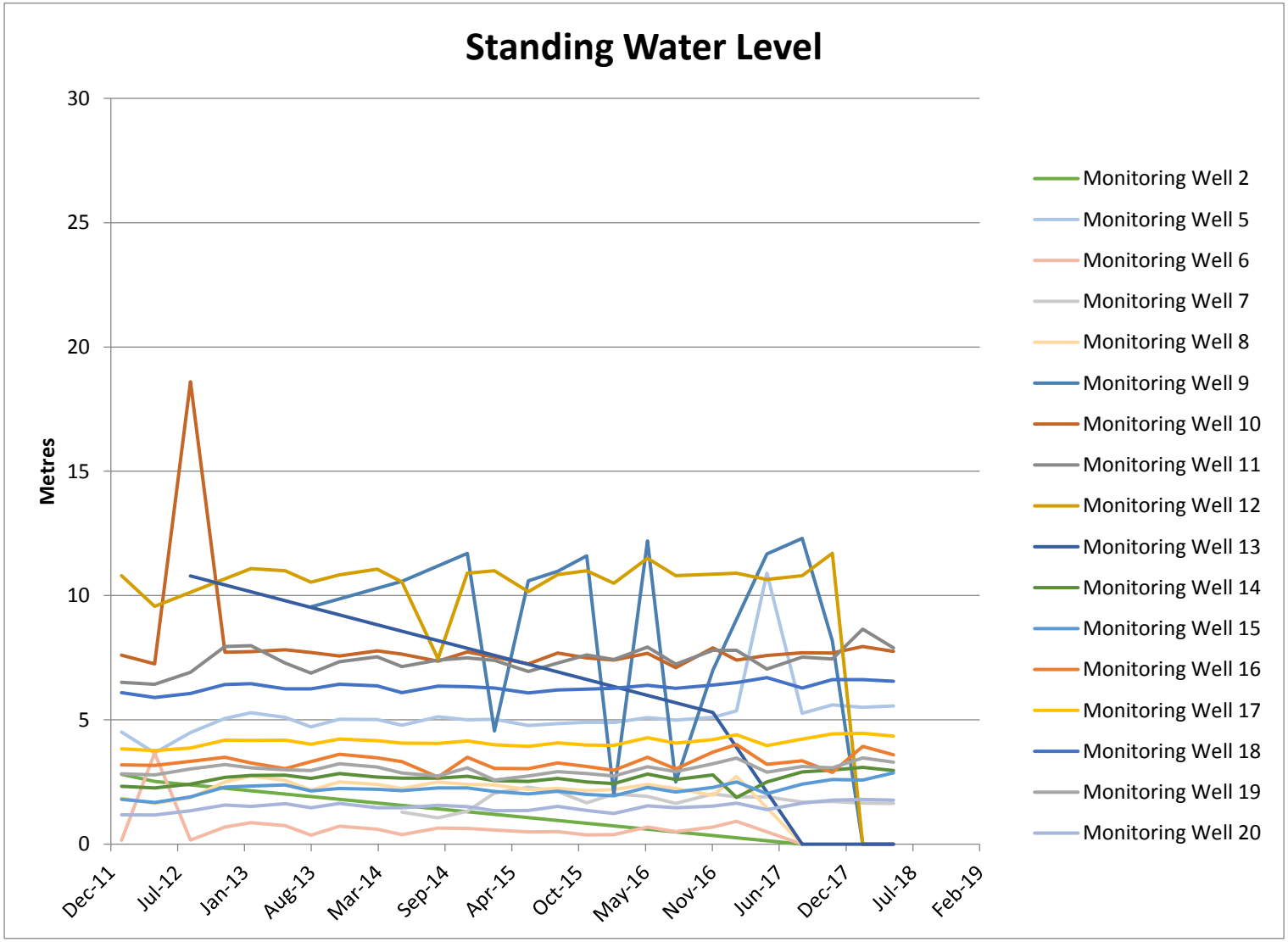
Sheet 1E


pH
pH (Units)
12
10
8
6
4
2
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

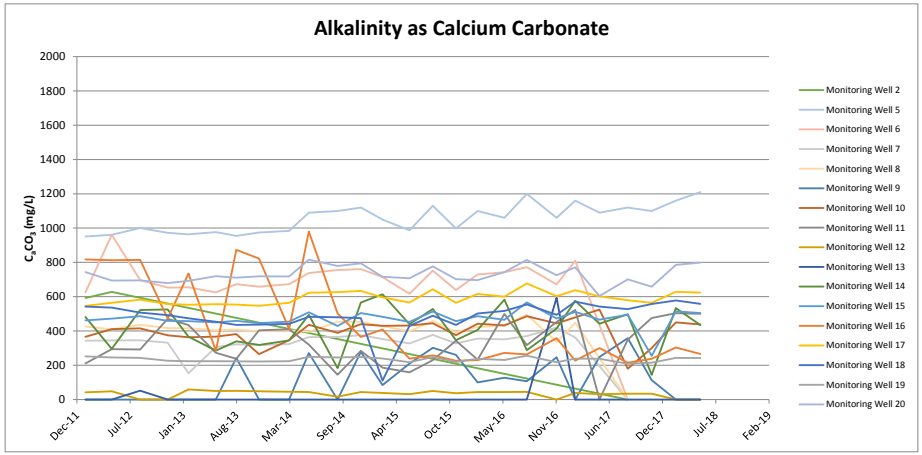

Filterable Iron
Fe (mg/L)
40
35
30
25
20
15
10
5
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

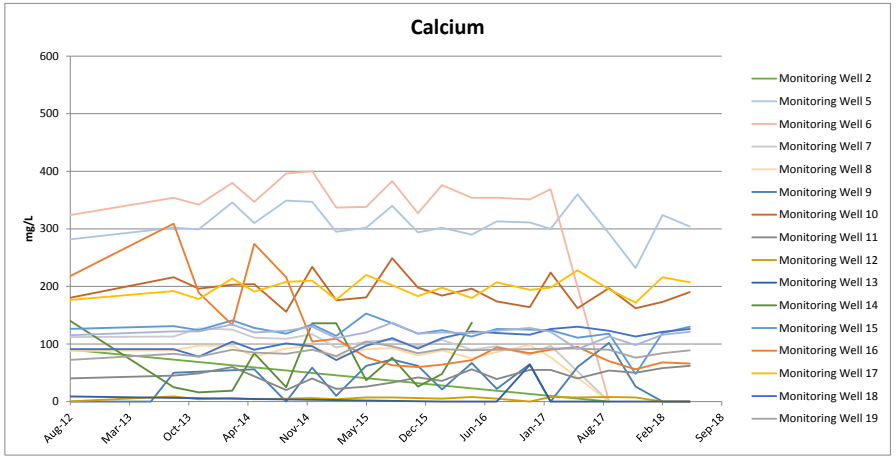

Temperature
Temp. (ºC)
30
25
20
15
10
5
0
Jul-98
Jan-04
Jul-09
Dec-14
Jun-20
Monitoring Point 1
Monitoring Point 33
Monitoring Point 34

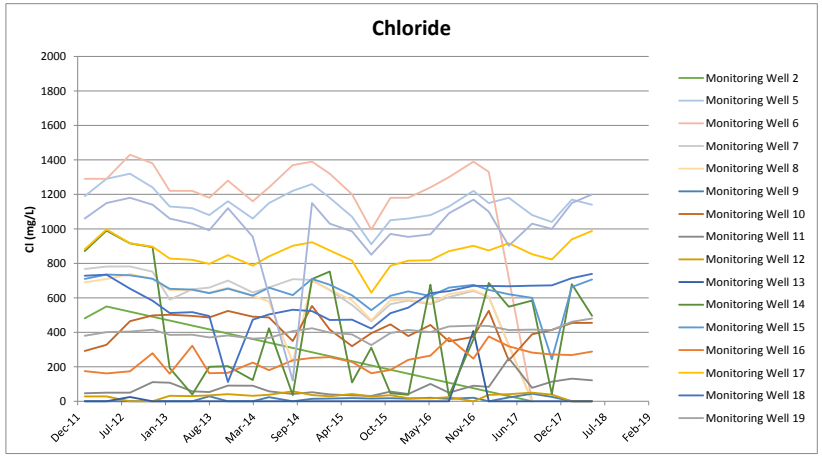
Sheet 2


Standing Water Level
Metres
30
25
20
15
10
5
0
Dec-11
Jul-12
Jan-13
Aug-13
Mar-14
Sep-14
Apr-15
Oct-15
May-16
Nov-16
Jun-17
Dec-17
Jul-18
Feb-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

Sheet 3A


Alkalinity as Calcium Carbonate
C_aCO_3 (mg/L)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Dec-11
Jul-12
Jan-13
Aug-13
Mar-14
Sep-14
Apr-15
Oct-15
May-16
Nov-16
Jun-17
Dec-17
Jul-18
Feb-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20


Calcium
mg/L
600
500
400
300
200
100
0
Aug-12
Mar-13
Oct-13
Apr-14
Nov-14
May-15
Dec-15
Jun-16
Jan-17
Aug-17
Feb-18
Sep-18
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19


Chloride
Cl (mg/L)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Dec-11
Jul-12
Jan-13
Aug-13
Mar-14
Sep-14
Apr-15
Oct-15
May-16
Nov-16
Jun-17
Dec-17
Jul-18
Feb-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
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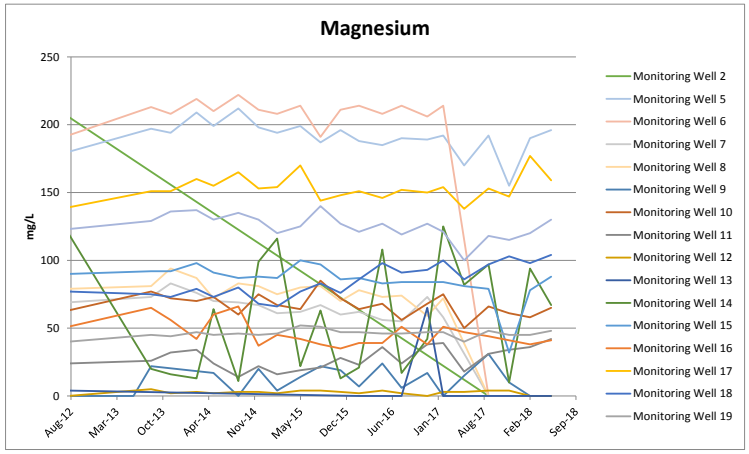
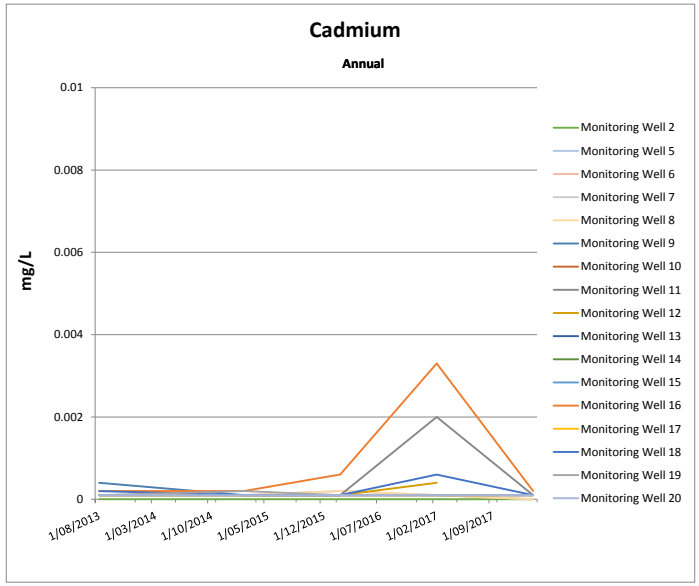
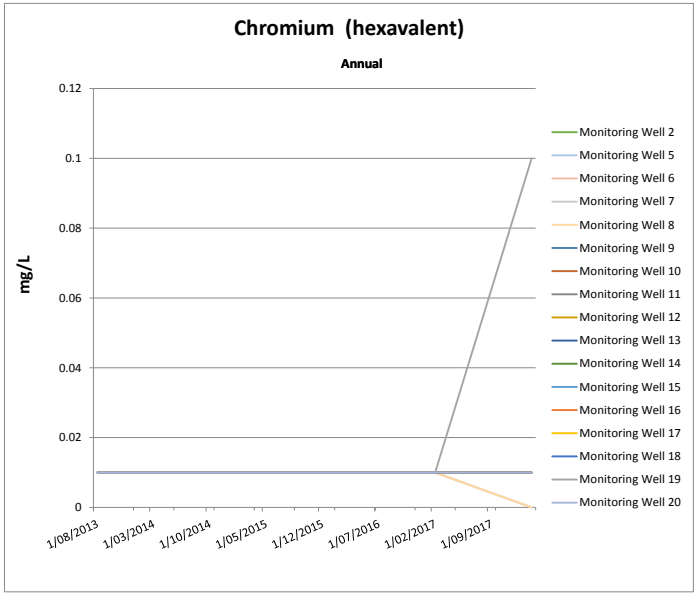
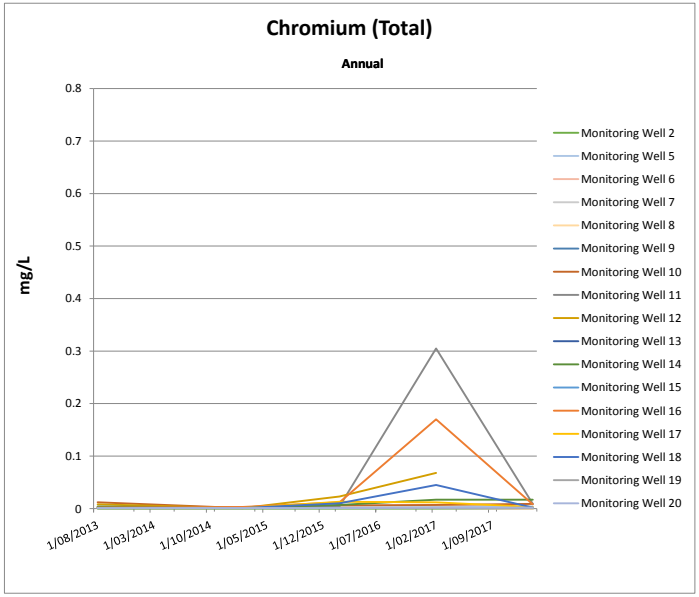
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19

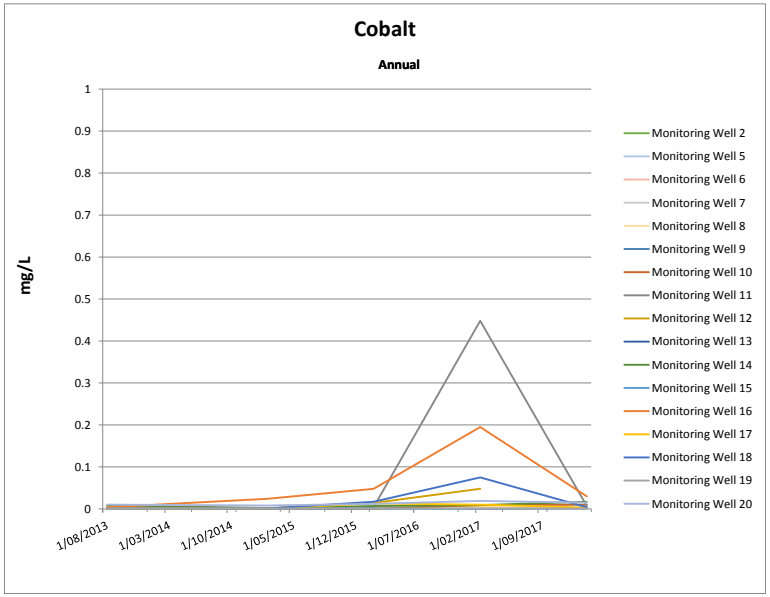

Magnesium
mg/L
250
200
150
100
50
0
Aug-12
Mar-13
Oct-13
Apr-14
Nov-14
May-15
Dec-15
Jun-16
Jan-17
Aug-17
Feb-18
Sep-18
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19

Sheet 3B

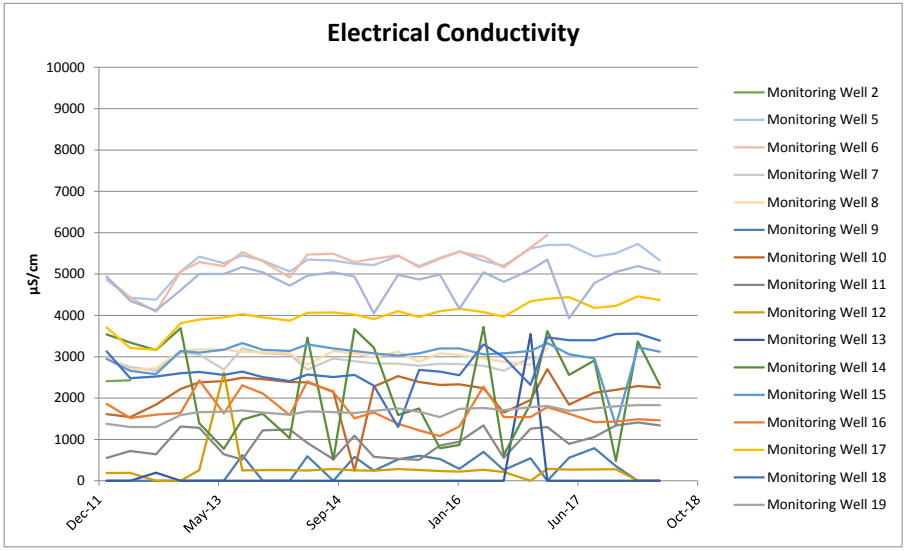

Cadmium
Annual
mg/L
0.01
0.008
0.006
0.004
0.002
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

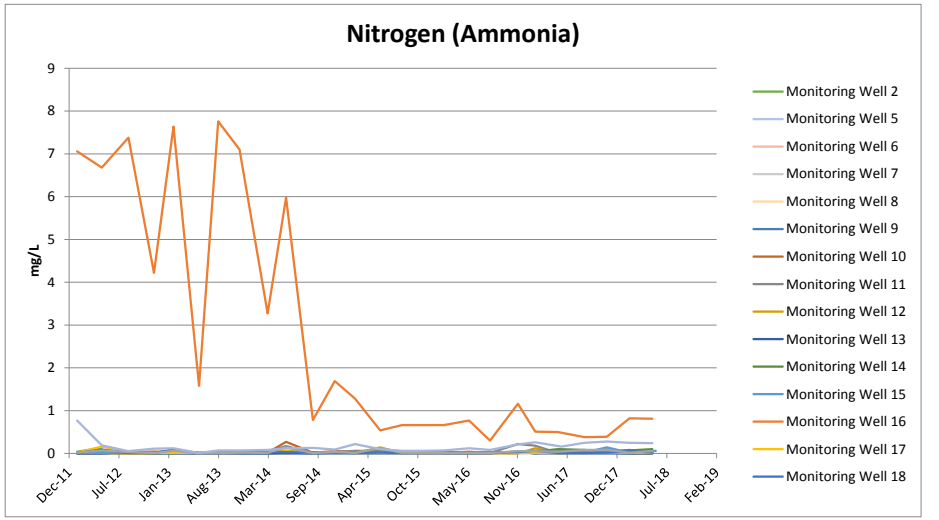

Chromium (hexavalent)
Annual
mg/L
0.12
0.1
0.08
0.06
0.04
0.02
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

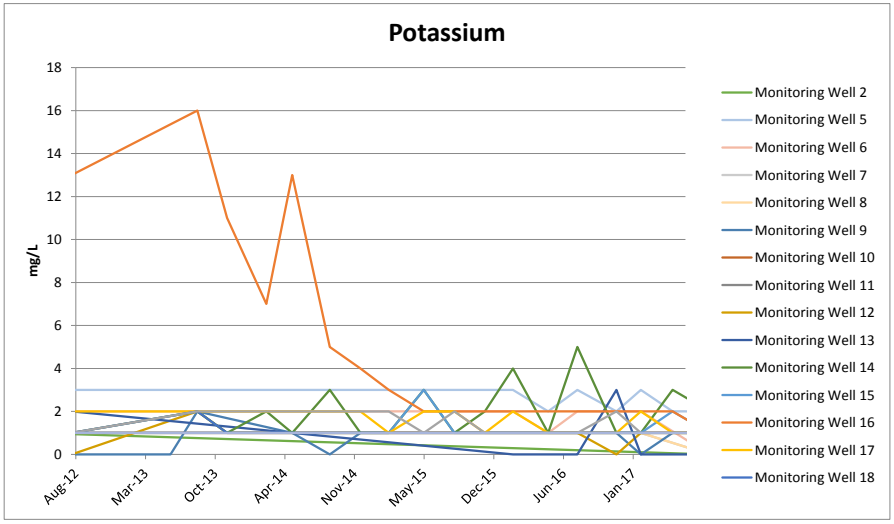

Chromium (Total)
Annual
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

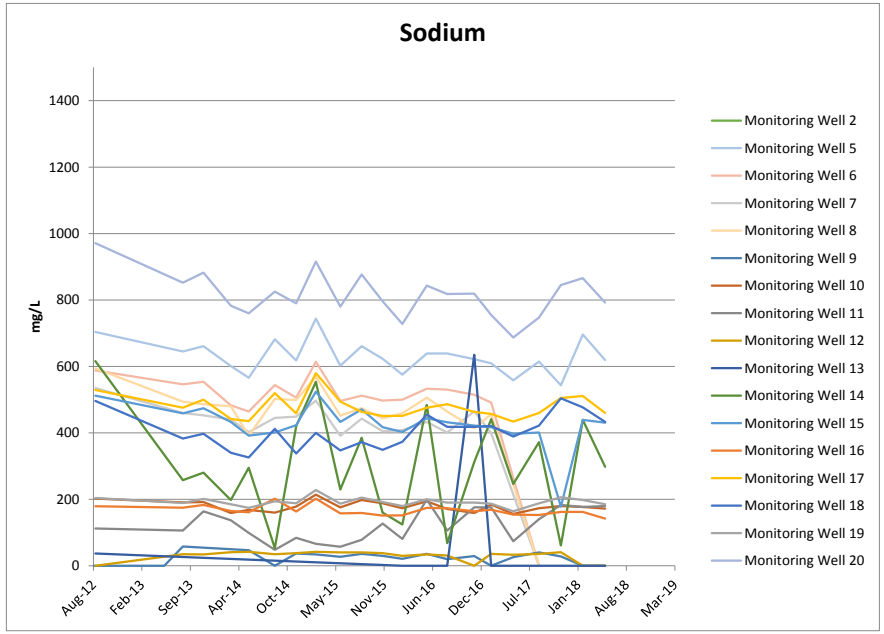

Cobalt
Annual
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

Sheet 3C


Electrical Conductivity
µS/cm
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Dec-11
May-13
Sep-14
Jan-16
Jun-17
Oct-18
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19


Nitrogen (Ammonia)
mg/L
9
8
7
6
5
4
3
2
1
0
Dec-11
Jul-12
Jan-13
Aug-13
Mar-14
Sep-14
Apr-15
Oct-15
May-16
Nov-16
Jun-17
Dec-17
Jul-18
Feb-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18


Potassium
mg/L
18
16
14
12
10
8
6
4
2
0
Aug-12
Mar-13
Oct-13
Apr-14
Nov-14
May-15
Dec-15
Jun-16
Jan-17
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18


Sodium
mg/L
1400
1200
1000
800
600
400
200
0
Aug-12
Feb-13
Sep-13
Apr-14
Oct-14
May-15
Nov-15
Jun-16
Dec-16
Jul-17
Jan-18
Aug-18
Mar-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
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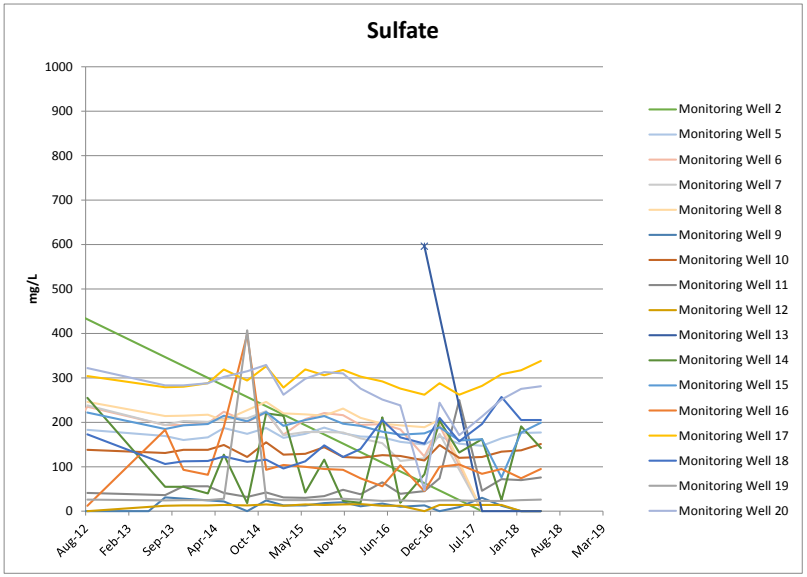
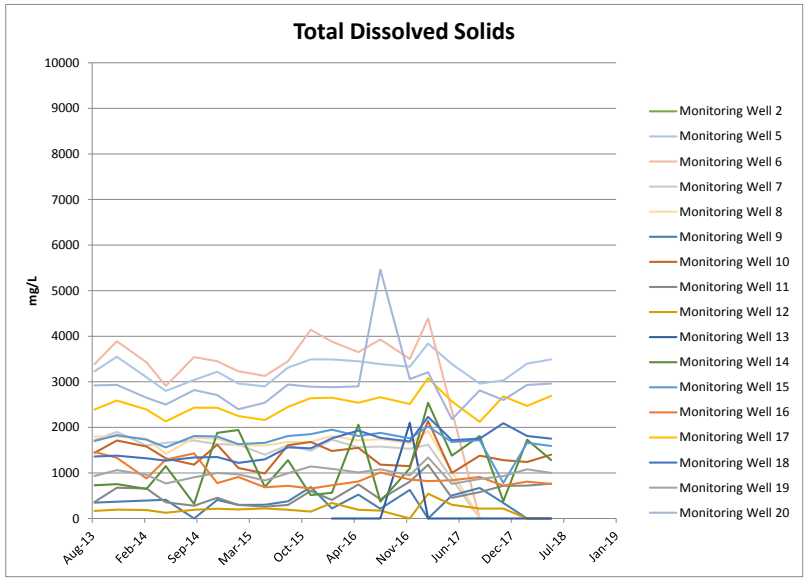
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

Sheet 3D


Sulfate
mg/L
1000
900
800
700
600
500
400
300
200
100
0
Aug-12
Feb-13
Sep-13
Apr-14
Oct-14
May-15
Nov-15
Jun-16
Dec-16
Jul-17
Jan-18
Aug-18
Mar-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20


Total Dissolved Solids
mg/L
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Aug-13
Feb-14
Sep-14
Mar-15
Oct-15
Apr-16
Nov-16
Jun-17
Dec-17
Jul-18
Jan-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
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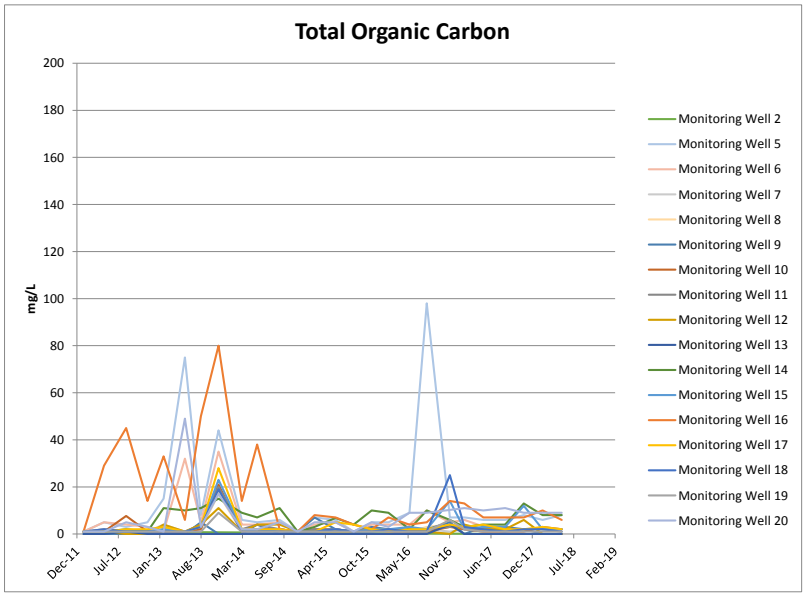
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20


Total Organic Carbon
mg/L
200
180
160
140
120
100
80
60
40
20
0
Dec-11
Jul-12
Jan-13
Aug-13
Mar-14
Sep-14
Apr-15
Oct-15
May-16
Nov-16
Jun-17
Dec-17
Jul-18
Feb-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
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Monitoring Well 13
Monitoring Well 14
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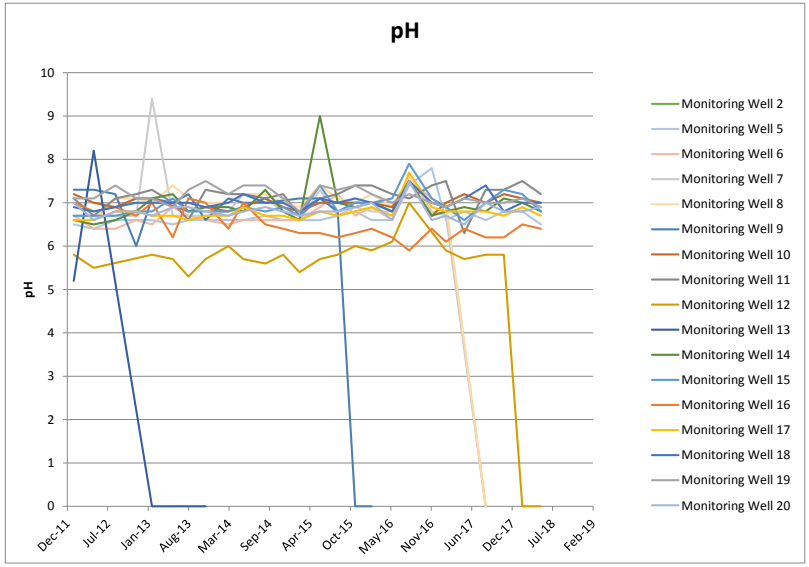
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20


pH
pH
10
9
8
7
6
5
4
3
2
1
0
Dec-11
Jul-12
Jan-13
Aug-13
Mar-14
Sep-14
Apr-15
Oct-15
May-16
Nov-16
Jun-17
Dec-17
Jul-18
Feb-19
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
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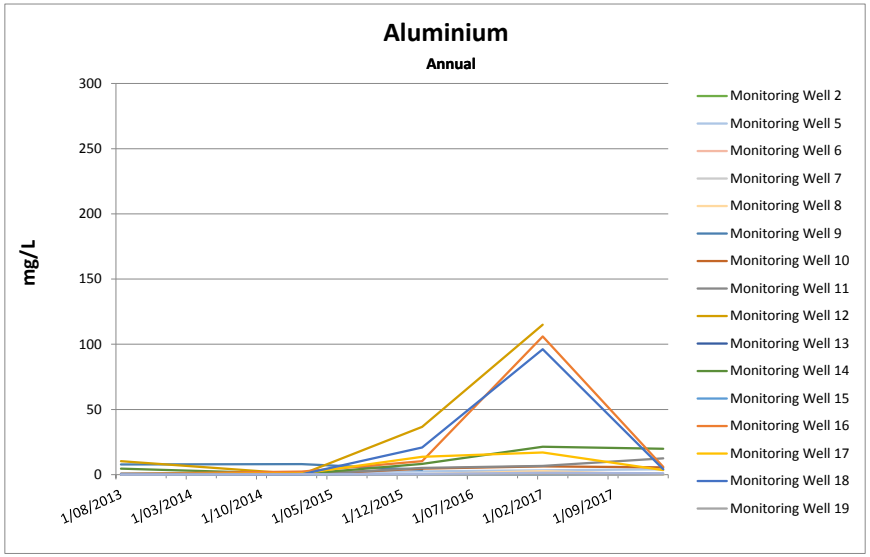
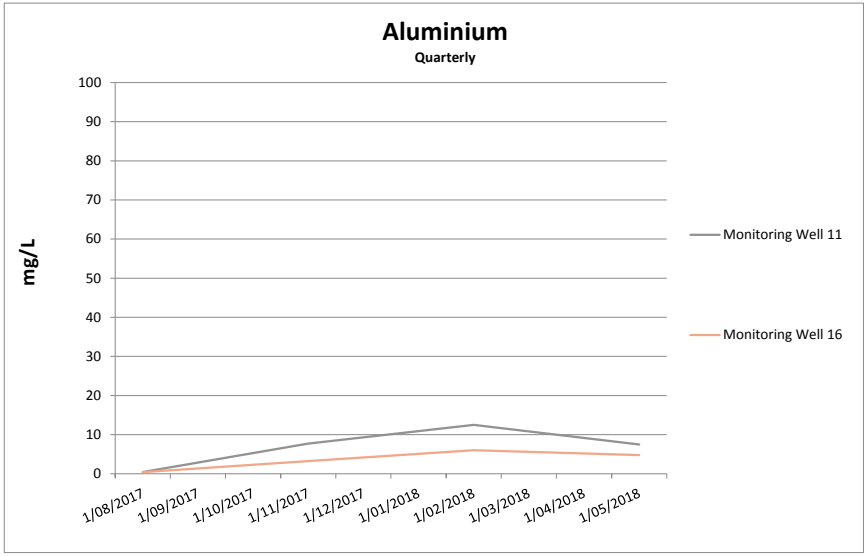
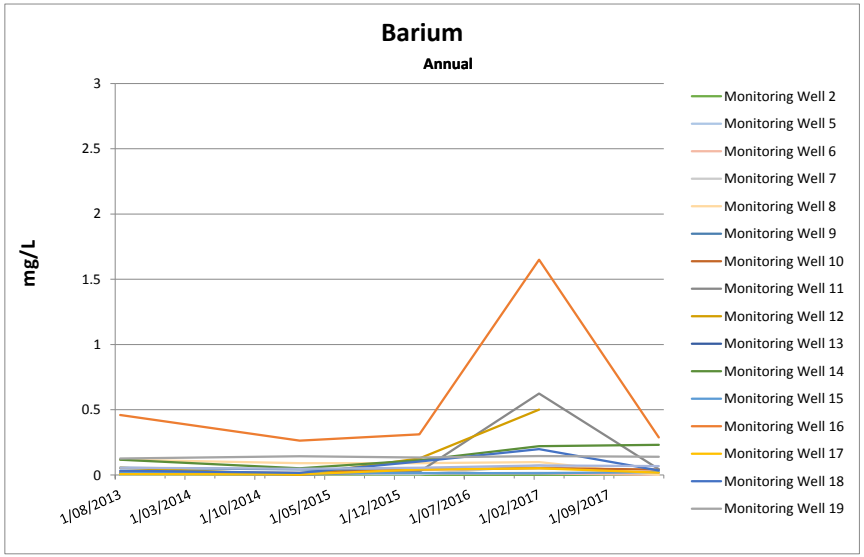
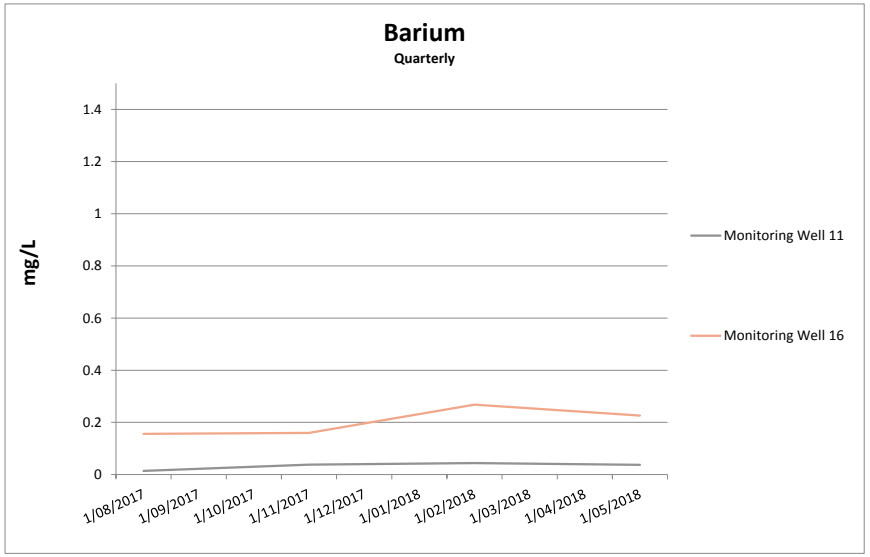
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

Sheet 3E

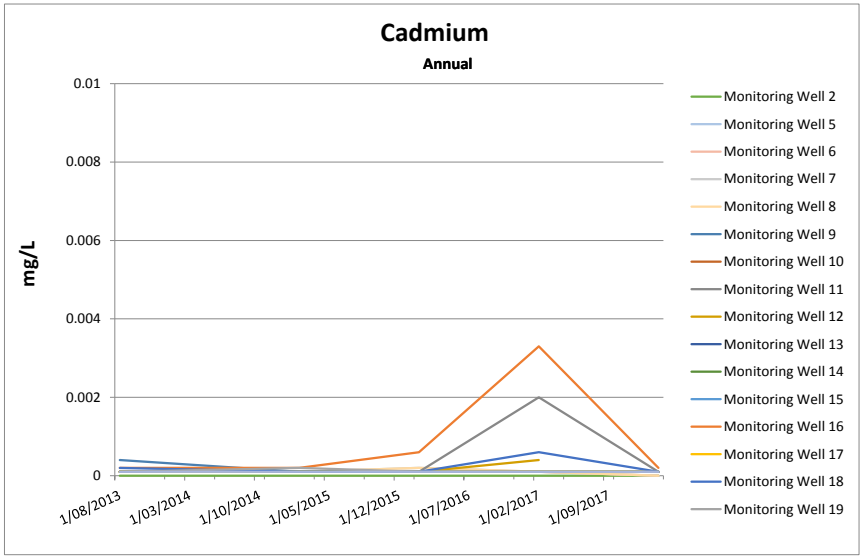

Aluminium
Annual
mg/L
300
250
200
150
100
50
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19

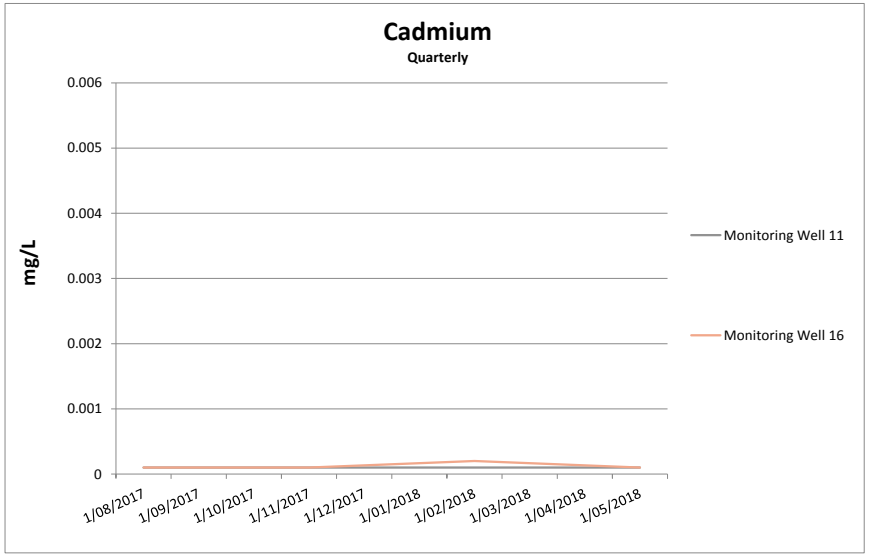

Aluminium
Quarterly
mg/L
100
90
80
70
60
50
40
30
20
10
0
1/08/2017
1/09/2017
1/10/2017
1/11/2017
1/12/2017
1/01/2018
1/02/2018
1/03/2018
1/04/2018
1/05/2018
Monitoring Well 11
Monitoring Well 16

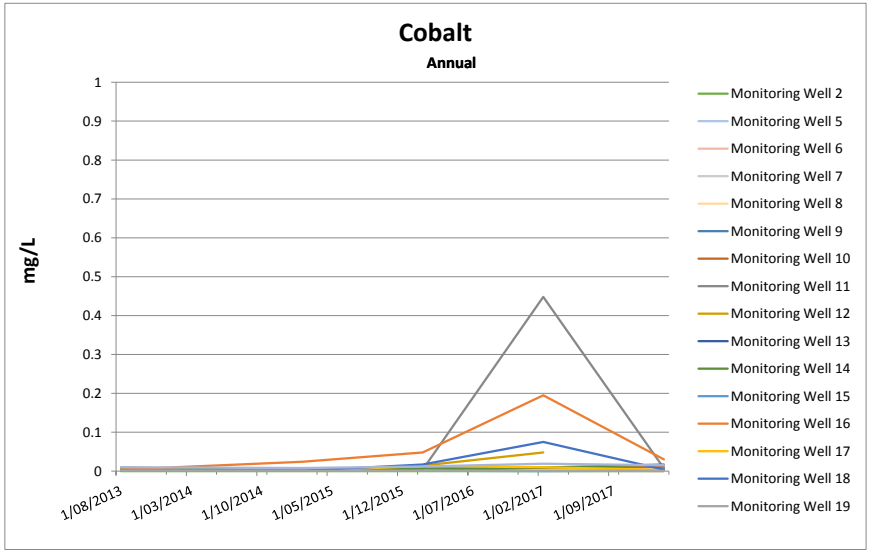

Barium
Annual
mg/L
3
2.5
2
1.5
1
0.5
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19

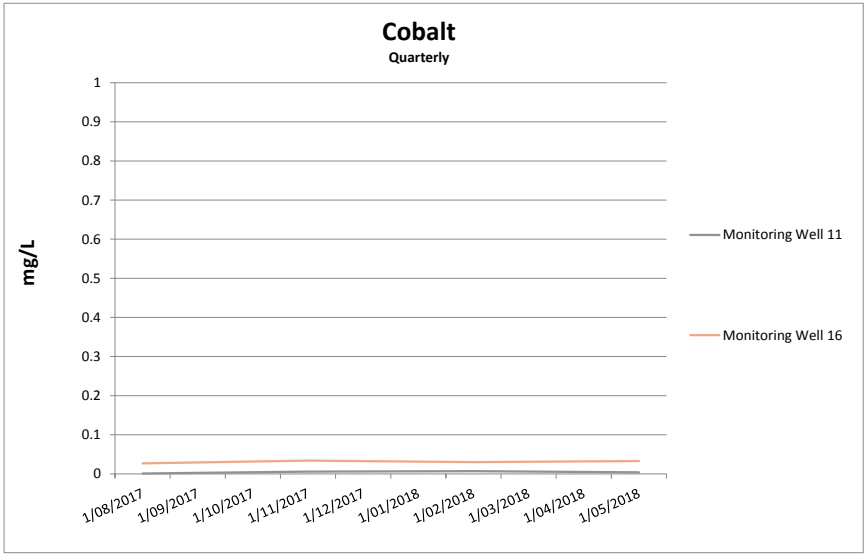

Barium
Quarterly
mg/L
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1/08/2017
1/09/2017
1/10/2017
1/11/2017
1/12/2017
1/01/2018
1/02/2018
1/03/2018
1/04/2018
1/05/2018
Monitoring Well 11
Monitoring Well 16

Sheet 3F

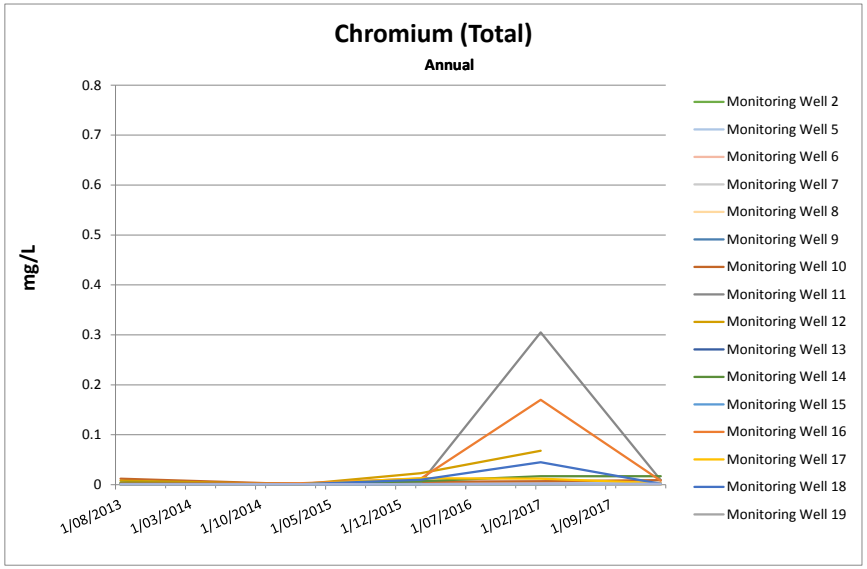

Cadmium
Annual
mg/L
0.01
0.008
0.006
0.004
0.002
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19


Cadmium
Quarterly
mg/L
0.006
0.005
0.004
0.003
0.002
0.001
0
1/08/2017
1/09/2017
1/10/2017
1/11/2017
1/12/2017
1/01/2018
1/02/2018
1/03/2018
1/04/2018
1/05/2018
Monitoring Well 11
Monitoring Well 16


Cobalt
Annual
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
Monitoring Well 17
Monitoring Well 18
Monitoring Well 19


Cobalt
Quarterly
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1/08/2017
1/09/2017
1/10/2017
1/11/2017
1/12/2017
1/01/2018
1/02/2018
1/03/2018
1/04/2018
1/05/2018
Monitoring Well 11
Monitoring Well 16

Sheet 3G


Chromium (Total)
Annual
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
Monitoring Well 2
Monitoring Well 5
Monitoring Well 6
Monitoring Well 7
Monitoring Well 8
Monitoring Well 9
Monitoring Well 10
Monitoring Well 11
Monitoring Well 12
Monitoring Well 13
Monitoring Well 14
Monitoring Well 15
Monitoring Well 16
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Monitoring Well 18
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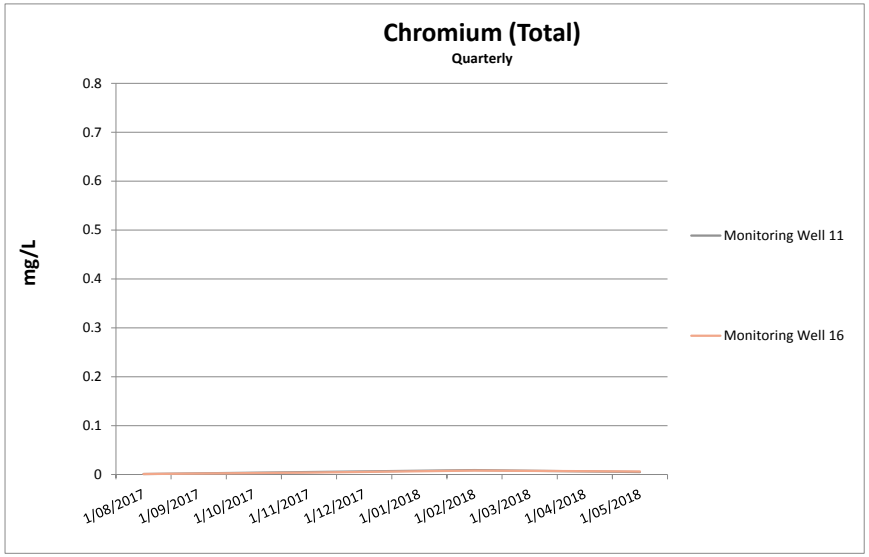
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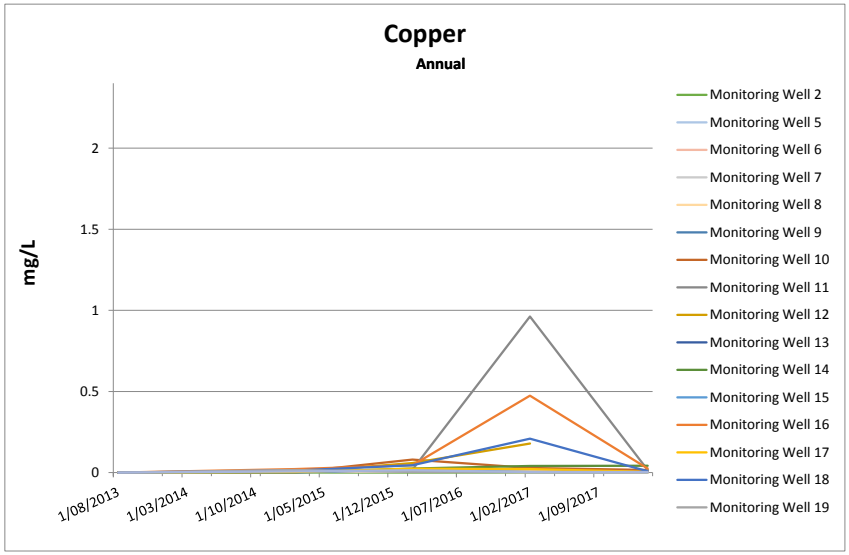
0
1/08/2017
1/09/2017
1/10/2017
1/11/2017
1/12/2017
1/01/2018
1/02/2018
1/03/2018
1/04/2018
1/05/2018
Monitoring Well 11
Monitoring Well 16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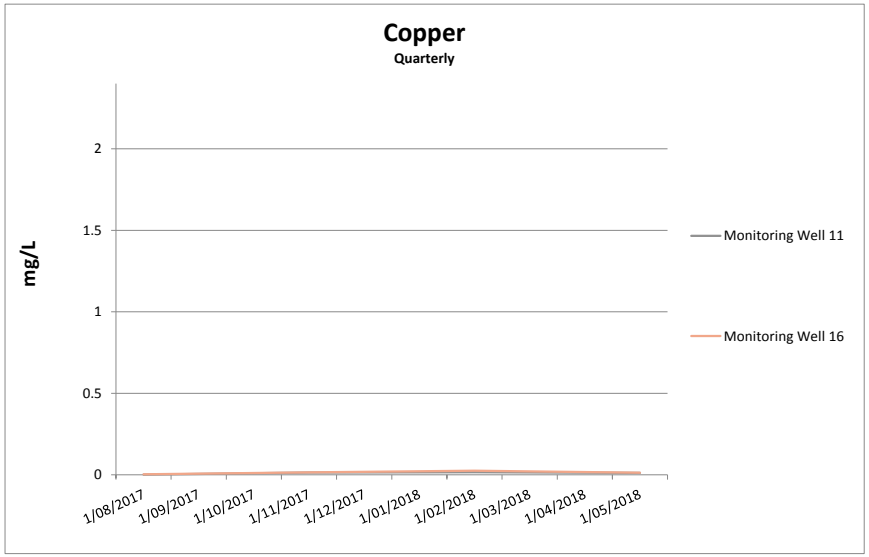
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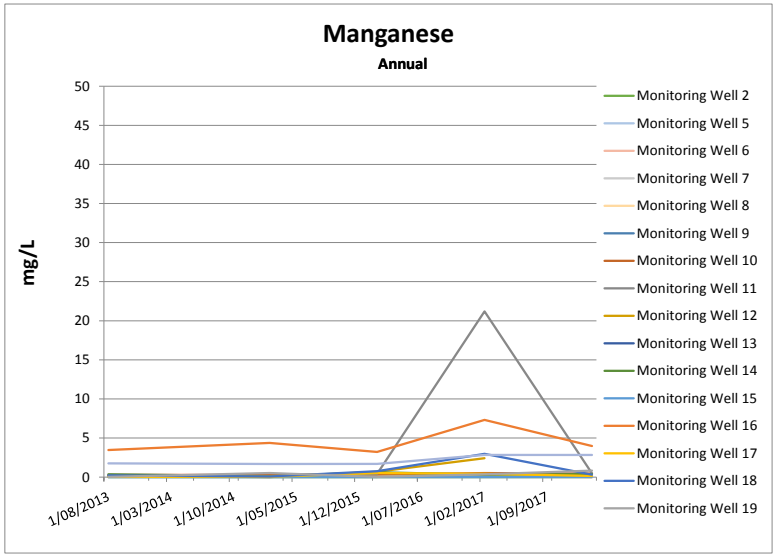
Sheet 3H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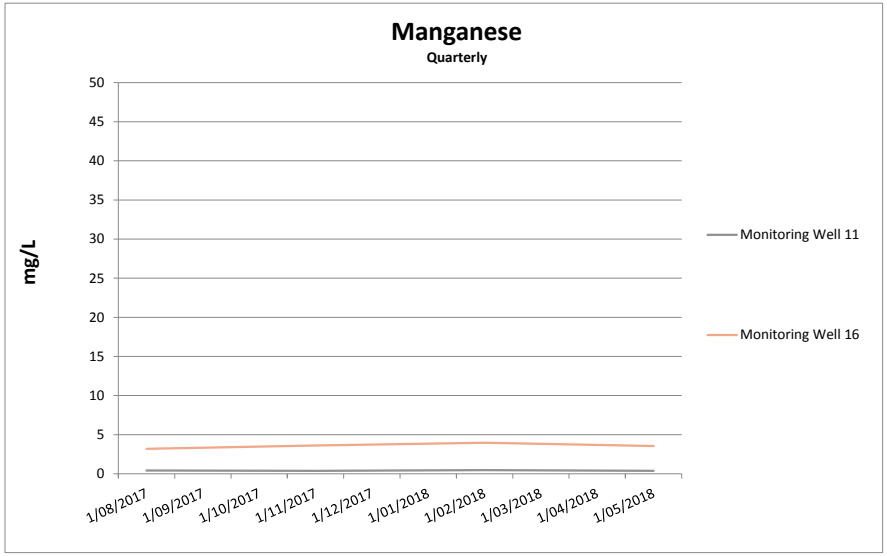
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mg/L
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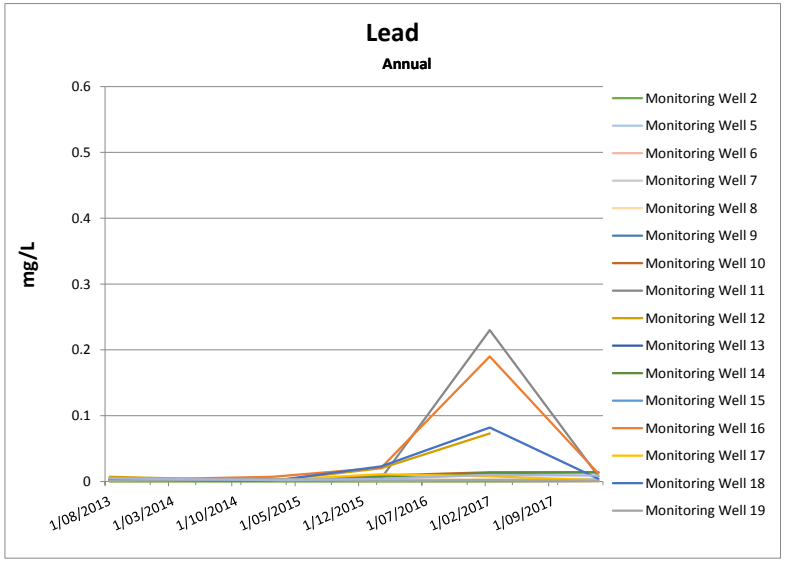
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mg/L
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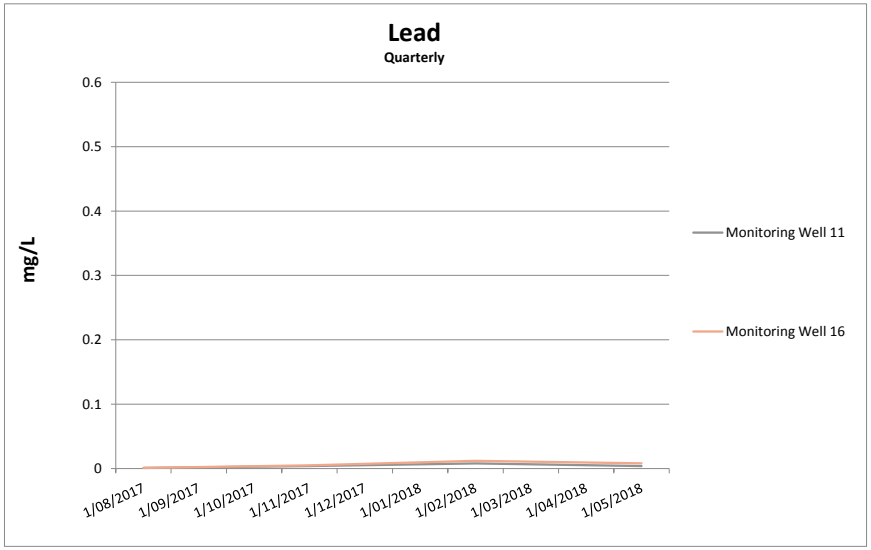
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mg/L
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1/11/2017
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1/05/2018
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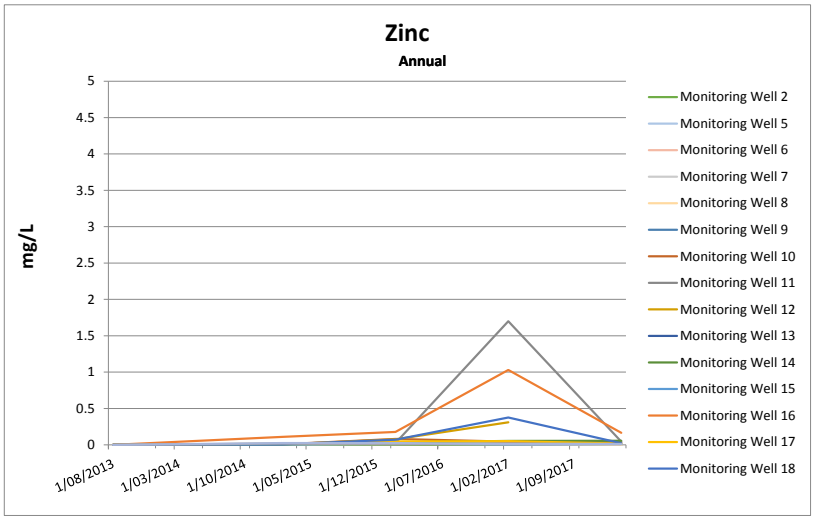
Monitoring Well 16

Sheet 3I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Annual
mg/L
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4
3.5
3
2.5
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1.5
1
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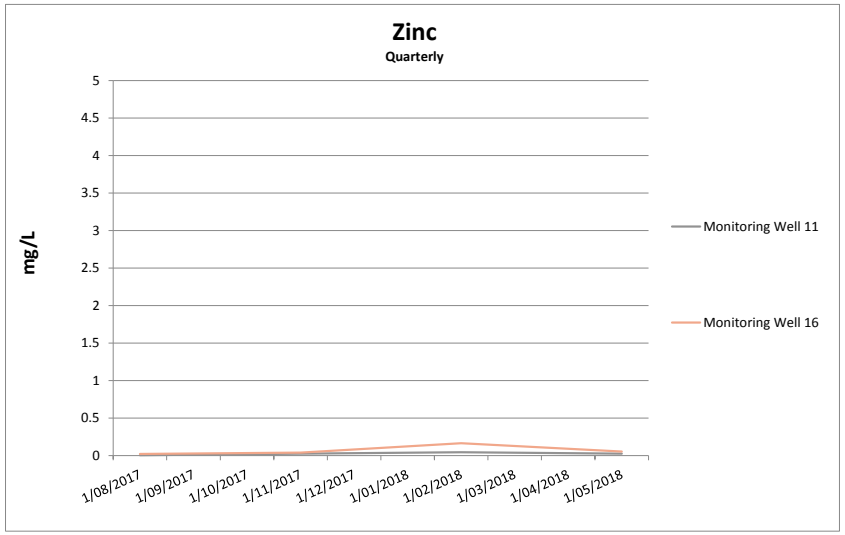
Zinc
Quarterly
mg/L
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4.5
4
3.5
3
2.5
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0
1/08/2017
1/09/2017
1/10/2017
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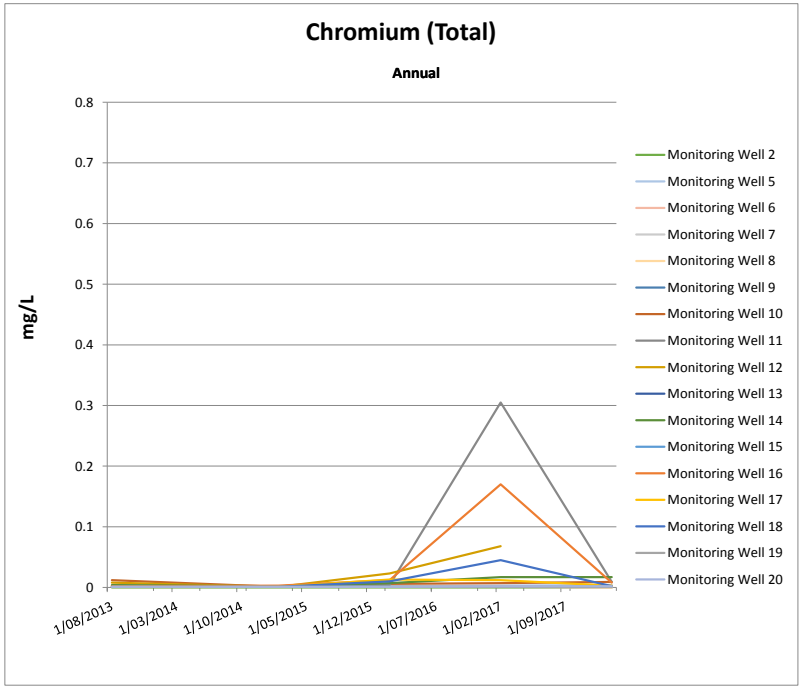
Chromium (Total)
Annual
mg/L
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0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1/08/2013
1/03/2014
1/10/2014
1/05/2015
1/12/2015
1/07/2016
1/02/2017
1/09/2017
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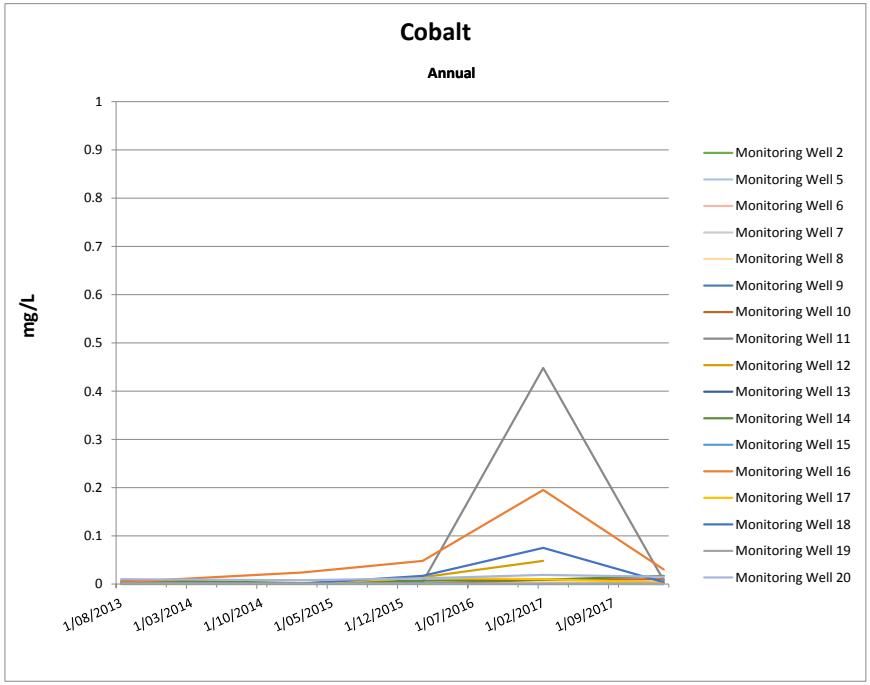
Monitoring Well 20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Monitoring Well 17
Monitoring Well 18
Monitoring Well 19
Monitoring Well 20

Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot)

Environment Protection Licence 5862

Annual Report

Period 29 May 2016 – 28 May 2017

Reference Z17/136791

Wollongong City Council
Locked Bag 8821
WOLLONGONG DC NSW 2500
Telephone 02 4227 7111
Facsimile 02 4227 7277
www.wollongong.nsw.gov.au

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ANNEXURE A
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ANNUAL RETURN 2016-2017

ABBREVIATIONS

Al	Aluminium
ANZECC	Australian and New Zealand Environment Conservation Council
Ar	Arsenic
Ba	Barium
Ca	Calcium
$CaCO_3$	Calcium Carbonate
Cd	Cadmium
CH_4	Methane
Cl	Chloride
Co	Cobalt
Cr	Chromium
Cu	Copper
DC	Development Consent
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
F	Fluoride
K	Potassium
LEMP	Landfill Environmental Management Plan
Mg	Magnesium
Mn	Manganese
Na	Sodium
NH_3	Ammonia
NO_3	Nitrate
NO_2	Nitrite
ppm	Parts per Million
SO_4	Sulfate
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
WWARRP	Wollongong Waste And Resource Recovery Park (Whytes Gully)
Zn	Zinc

1 INTRODUCTION

1.1 BACKGROUND

The City of Wollongong is located 80 kilometres south of Sydney. The Wollongong City Council (Council) governance area occupies a relatively narrow coastal strip bordered by the Royal National Park to the north, the Windang Bridge and Yallah to the south, the Tasman Sea to the east and the escarpment to the west.

Council owns and operates the Wollongong Waste and Resource Recovery Park (the Site), which is located on Reddalls Road at Kembla Grange. The Site is situated south west of Wollongong's central business district on approximately 50 hectares and is comprised of Lots 50, 52 and 53 of DP 1022266 and Lot 2 of DP 240557.

Council holds an Environmental Protection Licence (EPL) number 5862, for "Waste Disposal by Application to Land" for the Site. Council currently operates in accordance with the sites Landfill Environmental Management Plan (LEMP) and in accord with the requirements of the Sites EPL and Development Consent (DC).

1.2 OBJECTIVES OF THE ANNUAL REPORT

Condition R1.8 of the EPL specifies that Council must provide an Annual Report to accompany the Annual Return for the Site. The objective of this report is to provide that review.

1.3 SITE HISTORY

Whytes Gully was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. Initially, the 'western gully' section was landfilled. The western gully is unlined by modern standards and was used from 1982 to 1993. Initially coal wash refuse was used to provide daily cover, then around 1988/89 steel furnace slag was introduced because of its stability in wet weather and Council's inability to source local clean fill in sufficient quantities. The leachate collection from the western gully is through a series of rock drains at the centre of each lift. The rock drains connect with a riser and the leachate flows from riser to riser, and then to the leachate collection well at the base of the western gully. The western gully section of the landfill has been capped with clay to varying depths between 1m and 4m.

The 'eastern gully' section development received consent in 1992/93, following extensive public consultation. The eastern gully section is lined with a single layer of HDPE smooth liner, over a subsoil drainage layer of 5mm gravel and a corrugated groundwater drainage system. The eastern gully was excavated to rock and was developed in two stages, beginning with the first stage 80 to 100m above the slope from the current toe of the landfill embankment. The leachate is drained from the first stage of the eastern gully via a 300mm corrugated drainage pipe at the base and a 300mm thick sand layer above the liner.

The second stage of the eastern gully operates in front and above the first stage, with extended leachate drains and HDPE liner. From 2014 to 2016 the eastern gully underwent extensive surface reshaping works

in order to reduce rainwater infiltration, increase surface water diversion, ensure consistent cover depths and to prepare the surface for the new landfill cell base liner.

The new stage 3 landfill development commenced with construction below the eastern gully in August 2013, with the first cell 1A completed in 2014. Waste commenced being placed in Cell 1A in March 2015. Council has since constructed Cell 1B (2015) and commenced filling. Cell 2 is currently being constructed.

Leachate is collected from all landfilled areas at the site and treated in a 3 stage process. The leachate is initially collected in a primary holding pond that uses a biological process and aeration to strip the leachate of ammonia. The leachate is then pumped to a smaller pond with a larger surface area to increase the speed of this process on a batch by batch basis. From the smaller pond the leachate is then pumped to a sequential batch reactor that in conjunction with a filtration system eliminates the residual contaminants in the leachate suitable for acceptance by sewer under the sites Trade Wastewater Agreement with Sydney Water.

1.4 RELEVANT DOCUMENTS

This annual report refers to and / or draws upon information and data from the following documents;

- Whytes Gully Waste Disposal Facility – Annual Return for Period 29 May 2015 to 28 May 2016. By Wollongong City Council July 2016
- Whytes Gully Waste Disposal Facility – Annual Return for Period 29 May 2014 to 28 May 2015. By Wollongong City Council July 2015
- Whytes Gully Waste Disposal Facility – Annual Return for Period 29 May 2013 to 28 May 2014. By Wollongong City Council July 2014
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2012 to 31 May 2013. By Wollongong City Council July 2013
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2011 to 31 May 2012. By Wollongong City Council July 2012
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2010 to 31 May 2011. By Wollongong City Council July 2011.
- Whytes Gully Waste Disposal Facility – Annual Report for Period 01 June 2009 to 31 May 2010. By GHD July 2010.

2 KEY LICENCE ISSUES

2.1 ENVIRONMENTAL PROTECTION LICENCE ANNUAL RETURNS

The Environment Protection Authority (EPA) has issued an *Environmental Protection Licence* (Licence No. 5862) for the landfill and related operations on the Whytes Gully site. The licence, issued under the *Protection of the Environment Operations Act 1997,* requires an annual return and report to be submitted to the EPA, including;

i. Statement of Compliance
ii. Monitoring and Complaints Summary
iii. Statement of Compliance – Licence Conditions
iv. Statement of Compliance - Load-Based Fee
v. Statement of Compliance – Requirement to Prepare Pollution Incident Response Management Plan
vi. Statement of Compliance – Requirement to publish Pollution Monitoring Data
vii. Statement of Compliance – Environmental Management Systems and Practices

The EPL Annual Returns for 2008 to 2016 reporting periods were reviewed to provide a background to this report. These Annual Returns can be summarised as follows:

01 June 2008 to 31 May 2009

B1. Pollution complaints - Nine
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Ten non compliances.
C2. Details of non-compliance

1. *Stormwater pH measurement > 8.5*
2. *Four missed stormwater conductivity measurements*
3. *Stormwater suspended solids > 50mg/L twice*
4. *Four missed potassium groundwater measurements*
5. *One missed groundwater redox, coliforms and dissolved oxygen measurements*
6. *Three missed groundwater alkalinity measurements*
7. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium tests*
8. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*
9. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*
10. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*

01 June 2009 to 31 May 2010

B1. Pollution complaints - Twelve
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Five non compliances.

C2. Details of non-compliance

1. *Two missed stormwater temperature measurements*
2. *Missed stormwater filterable iron measurement*
3. *One round of groundwater monitoring missed*
4. *One round of groundwater monitoring missed*
5. *One round of landfill gas monitoring missed*

01 June 2010 to 31 May 2011

B1. Pollution complaints – Twelve

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Zero non-compliance.

C2. Details of non-compliance – N/A

01 June 2011 to 31 May 2012

B1. Pollution complaints – Forty Eight

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Zero non-compliance.

C2. Details of non-compliance – N/A

01 June 2012 to 31 May 2013

B1. Pollution complaints – Fifty nine

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Zero non-compliance.

C2. Details of non-compliance – N/A

29 May 2013 to 28 May 2014

B1. Pollution complaints – forty eight

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Two penalty notices issued.

C2. Details of non-compliance – Both penalty notices issues were associated with processes that Council did not undertake in accordance with the Whytes Gully Environment Protection Licence conditions. The first penalty notice was associated with excavating into waste to dispose of large flood related debris. Any waste excavation requires EPA pre-approval. The second penalty notice was associated with a major construction contractor not complying with the defined approved odour management plan for the works undertaken. Specifically, the maximum trench distance for the installation of a gas drainage pipe was exceeded. Both of these circumstances have been identified by the EPA as generating odour.

29 May 2014 to 28 May 2015

B1. Pollution complaints – Ten

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Zero
C2. Details of non-compliance – N/A

29 May 2015 to 28 May 2016

B1. Pollution complaints – Thirty Eight
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – One
*C2. Details of non-compliance – Suspended solids overflow from sediment pond that measured > 50 mg/*L.

Other Disclosure - One Official Caution dated 21 March 2016 was received during the reporting period for failing to identify the 2013-14 issued penalty notices within the Statement of Compliance section of the 2013-14 Annual Environment Management Report

29 May 2016 to 28 May 2017

B1. Pollution complaints – Twenty Seven
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Two non-compliance
*C2. Details of non -compliance – In June and July 2016 during significant rainfall events, surface water overflowed from the Whytes Gully site sediment ponds. The value of suspended solids measured 78 mg/L in June and 88 mg/L in July, which are higher than that specified in the EPL of 50 mg/*L

Licence Variations

The EPL has had several variations applied to it in recent years. These changes include:

- Removal of requirement to monitor redundant or removed environment monitoring points MP2, MP6, MP7 & MP8 on 22 June 2017.
- Approval to construct Package 2 & 3 Landfill Cells/Deep Leachate Drainage System 20 January 2017.
- Approval granted to construct and operate the new contingency leachate pond 23 November 2016.
- Approval to reinstate cover material descriptions and allow specific material types. Additional conditions regarding the management of onsite sediment basin/s at the premises. Streamline, add and update waste management conditions 14 October 2016.
- Approval granted to dispose of waste in Cell 1B on 01 September 2015
- Approval granted to dispose of waste in Cell 1A on 28 October 2014.
- Site boundaries updated to excise the previous Solid Waste to Energy Recovery Facility from the landfill licence to allow Visy to gain their own licence for the retrofit of the building as a Materials Recovery Facility. Also addition of a Potential Offensive Odour clause and analytical unit measures amended on 08 July 2014.
- Wording amendments and consolidation of various clauses as well as monitoring point updates in 23 August 2013.

- Inclusion of further enhanced and upgraded environment sampling points on 23 August 2013 for the Stage 3 (new landfill cell development).
- Overhauled and reformatted licence resulting from Council's request to modernise environmental testing requirements and to formally recognise the increased environmental sampling points and standards adopted by Council for the site. The request formed Annexure B of the 2010/2011 Annual Environmental Management Report and was formally approved and adopted by the EPA on 16 April 2012.
- Tidy up of various incremental site changes including lot and boundary amendments, sampling point review and update including location detail, removal of redundant trial and reporting details and various other updates in line with EPA reformatting and internal software and consistency changes 16 April 2012.
- Addition of pollution studies and reduction programs added on 28 November 2008.
- Scheduled Activity and Waste Classification structure changed on 17 October 2008.
- Reformatted licence including specification for cover material, litter control and other operational processes 20 November 2007.
- Clarification of water pollution prevention requirements on 11 October 2005.

3.1 SURFACE WATER MONITORING

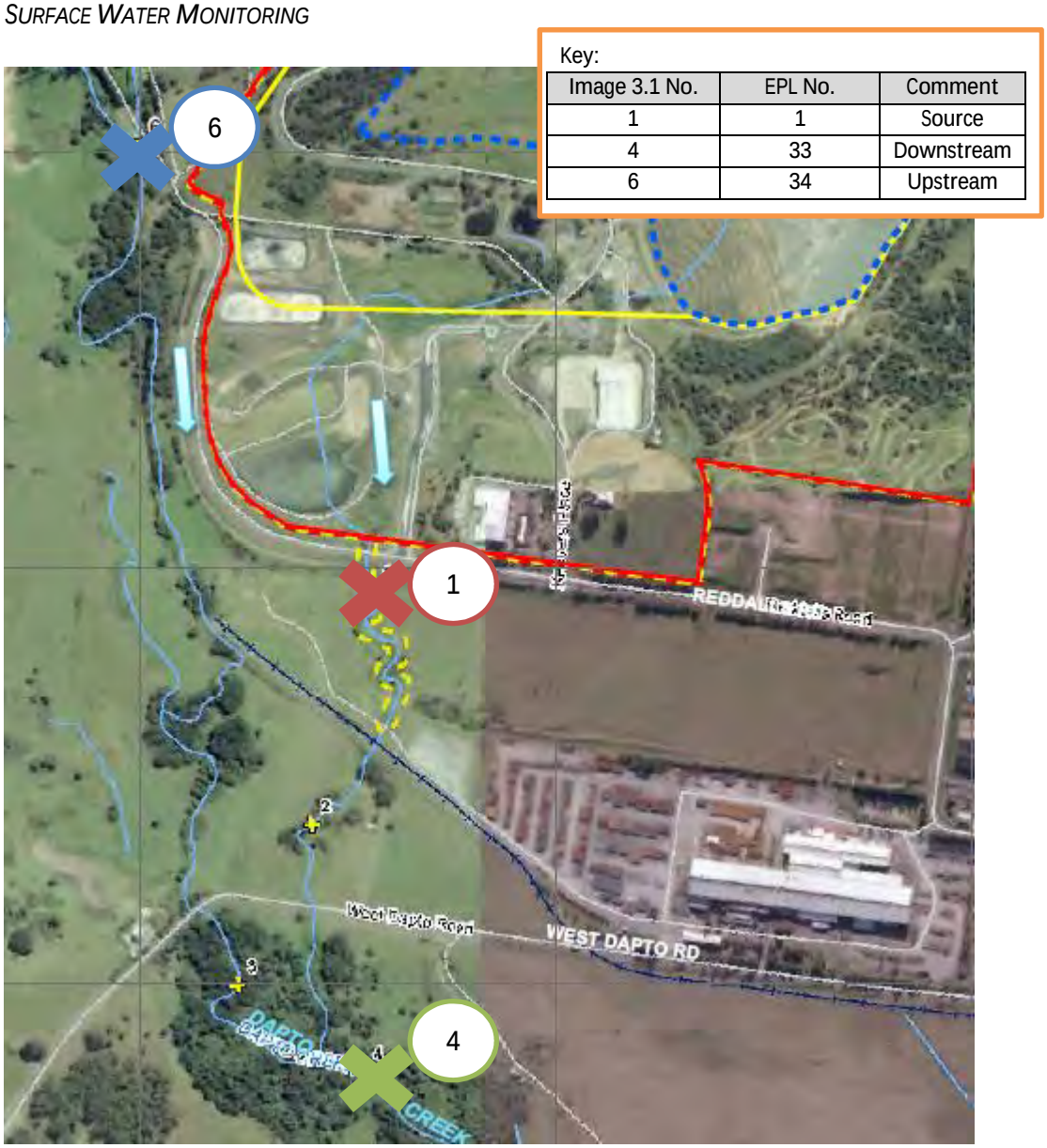


Image 3.1: Surface Water Flow Paths and EPL Sample Point Locations.

3.1.1 Tabulated Results (Annual Sample)

As per the sites EPL, a single annual sample and sampling of each stormwater overflow event was undertaken with the following results:

Table 3.1.1. Annual stormwater monitoring results for the reporting period

	Feb 2017	EPA Monitoring Location		
Analyte	Units	1	33	34
Alkalinity	mg/L	203	96	63
Ammonia	mg/L	0.24	0.03	0.04
Calcium	mg/L	38	30	19
Chloride	mg/L	78	36	26
Conductivity	µS/cm	755	388	269
Dissolved O_2	mg/L	7.66	8.87	7.71
Iron	mg/L	0.08	0.12	0.26
Fluoride	mg/L	0.4	0.2	0.1
Magnesium	mg/L	20	13	8
Nitrate	mg/L	0.61	0.53	0.47
Potassium	mg/L	16	3	4
Sodium	mg/L	97	31	26
Sulfate	mg/L	30	24	17
Temperature	^{o}C	21.6	19.6	21
TOC	mg/L	17	4	6
TP	mg/L	<0.05	<0.05	<0.05
TSS	mg/L	19	5	24
pH	pH	7.7	7.2	7

3.1.2 Tabulated Results (Discharge or Overflow Events)

Additionally, overflow events were also sampled as per the sites EPL. With the following results:

Table 3.1.2.1 Overflow stormwater monitoring results for the reporting period

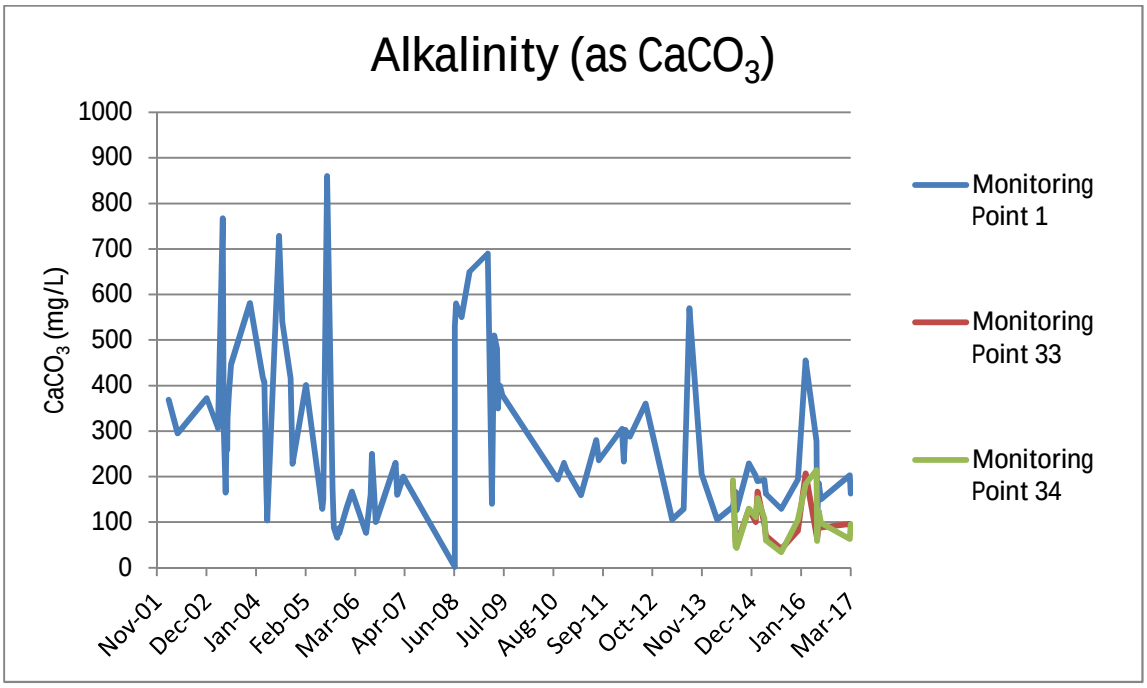
Analyte	Units	EPA Monitoring Point 1				
		3/6/2016	7/6/2016	20/6/2016	8/7/2016	7/3/2017
Alkalinity	mg/L	278	103	186	150	163
Ammonia	mg/L	0.05	1.3	0.61	0.2	0.66
Calcium	mg/L	35	20	25	34	27
Chloride	mg/L	175	33	54	55	48
Conductivity	µS/cm	1160	367	566	532	523
Dissolved O_2	mg/L	9.59	7.33	8.13	8.08	5.79
Iron	mg/L	<0.05	0.16	0.12	0.14	0.25
Fluoride	mg/L	0.5	0.2	0.3	0.3	0.2
Magnesium	mg/L	27	10	14	16	14
Nitrate	mg/L	0.35	1.07	1.36	0.2	0.66
Potassium	mg/L	18	7	9	9	12
Sodium	mg/L	150	34	59	58	58
Sulfate	mg/L	42	41	23	31	20
Temperature	°C	14.4	15.2	16.7	13.7	22.1
TP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
TOC	mg/L	14	16	2	11	18
TSS	mg/L	7	78	27	88	28
pH	pH	7.9	7.7	8.1	7.5	7.3

Analyte	Units	EPA Monitoring Point 33				
		3/6/2016	7/6/2016	20/6/2016	8/7/2016	7/3/2017
Alkalinity	mg/L	72	63	90	88	88
Ammonia	mg/L	0.02	0.02	0.03	0.07	0.06
Calcium	mg/L	20	16	17	22	20
Chloride	mg/L	42	32	29	37	31
Conductivity	µS/cm	405	265	291	357	307
Dissolved O_2	mg/L	5.29	9.76	8.42	9.73	8.25
Iron	mg/L	0.22	0.16	0.3	0.22	0.14
Fluoride	mg/L	0.1	<0.1	0.1	0.1	<0.1
Magnesium	mg/L	11	7	7	9	9
Nitrate	mg/L	0.03	0.7	0.45	0.32	0.02
Potassium	mg/L	6	3	3	4	4
Sodium	mg/L	37	23	21	32	28
Sulfate	mg/L	47	16	21	26	18
Temperature	°C	14.5	14	15	14.4	20.9
TP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
TOC	mg/L	6	7	8	7	6
TSS	mg/L	12	19	53	47	19
pH	pH	6.4	7.5	7.5	7.7	7

Analyte	Units	EPA Monitoring Point 34				
		3/6/2016	7/6/2016	20/6/2016	8/7/2016	7/3/2017
Alkalinity	mg/L	214	59	124	98	95
Ammonia	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
Calcium	mg/L	52	18	22	27	26
Chloride	mg/L	51	31	33	27	36
Conductivity	µS/cm	633	249	328	383	348
Dissolved O_2	mg/L	8.14	10	8.24	10.2	8.59
Iron	mg/L	0.07	0.17	0.2	0.2	0.07
Fluoride	mg/L	0.2	<0.1	0.2	0.1	<0.1
Magnesium	mg/L	24	8	10	12	12
Nitrate	mg/L	0.05	0.46	0.46	0.37	0.16
Potassium	mg/L	3	2	2	3	3
Sodium	mg/L	39	20	21	26	25
Sulfate	mg/L	38	16	20	24	21
Temperature	°C	15	14.8	16.5	13.5	20.3
TP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
TOC	mg/L	4	6	7	5	3
TSS	mg/L	24	8	16	12	6
pH	pH	7.6	7.7	7.9	7.9	7

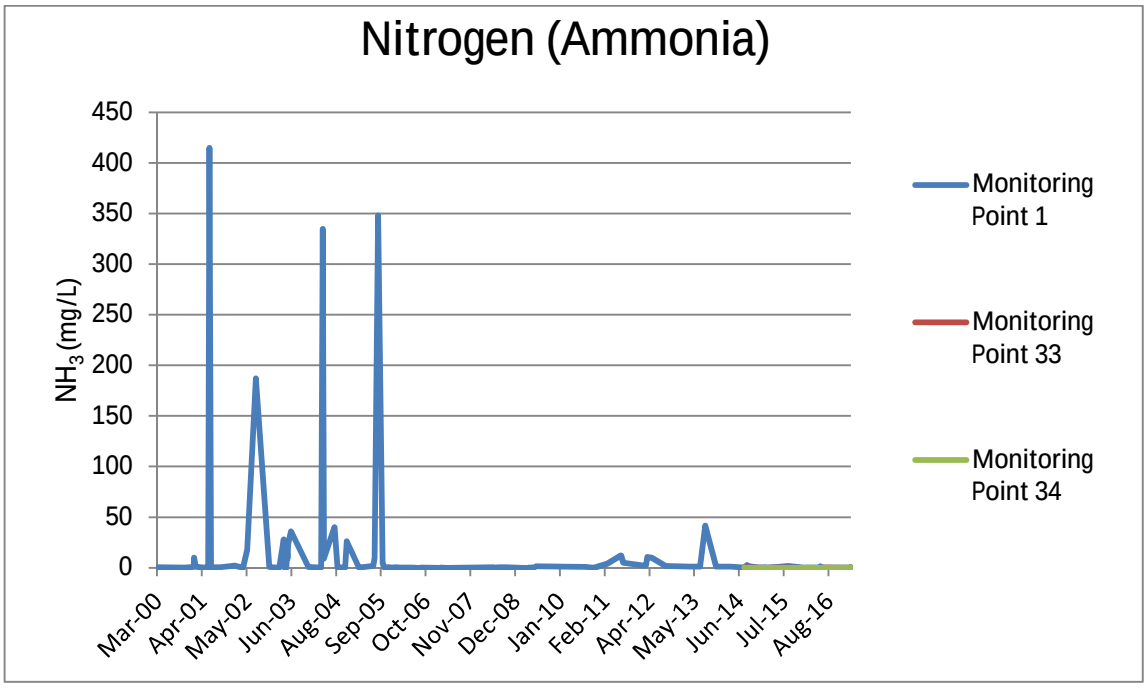
3.1.3 Data Presentation

Figure 3.1.3.1 Alkalinity results presentation



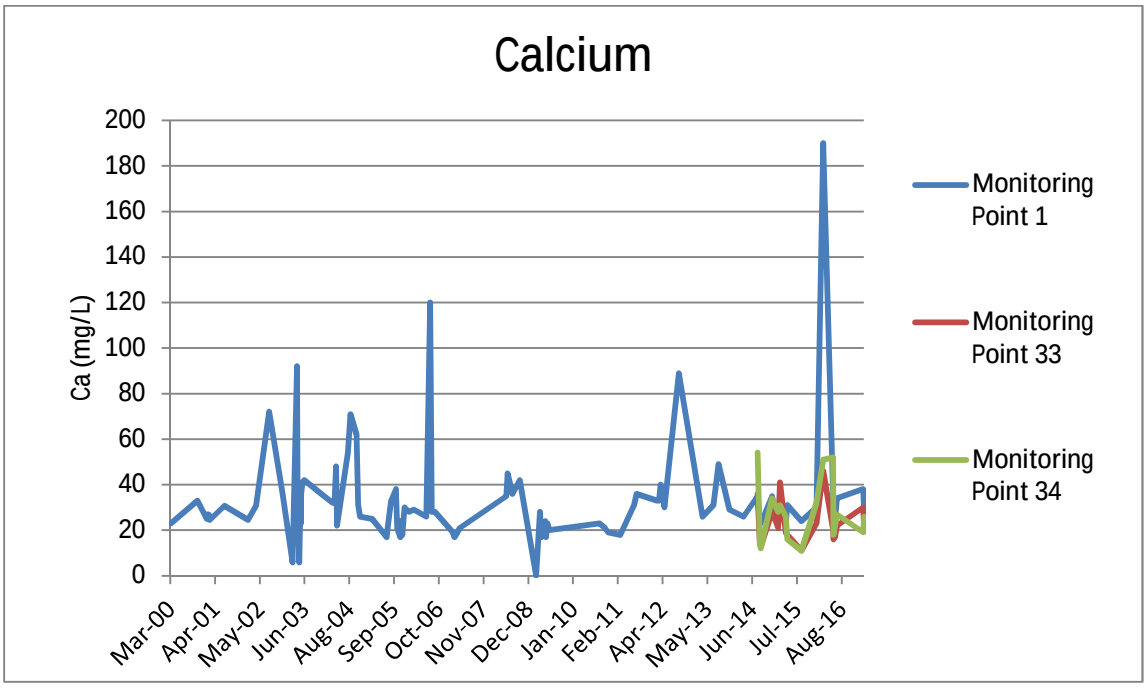
Alkalinity is a measure of waters capacity to resist changes in pH that would make the water more acidic (reduce pH). Therefore alkalinity is inextricably linked to pH values and should be further analysed if pH problems were evident. However, pH values have been maintained within the normal range for water bodies (6.5-8.5).

Figure 3.1.3.2 Ammonia results presentation



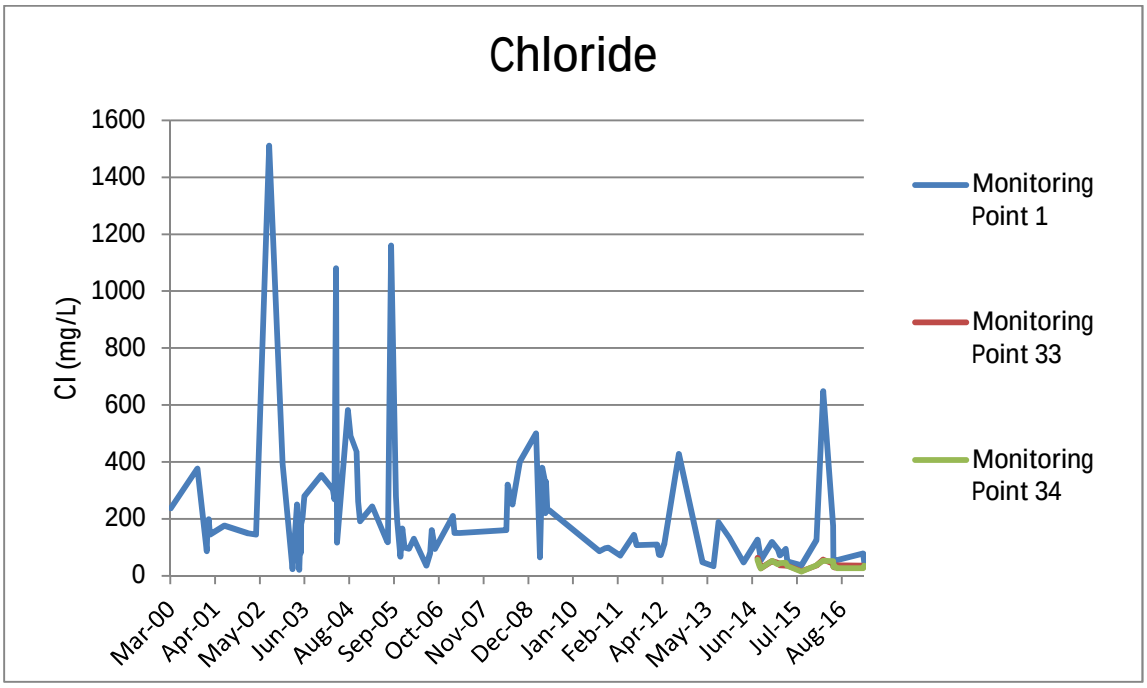
Ammonia is a by-product of the decomposition of organic matter. Therefore, increased ammonia levels can be a good indicator of environmental contamination sourced from landfill leachate. The low ammonia levels indicated suggests that leachate does not appear to be infiltrating the stormwater pond.

Figure 3.1.3.3 Calcium results presentation



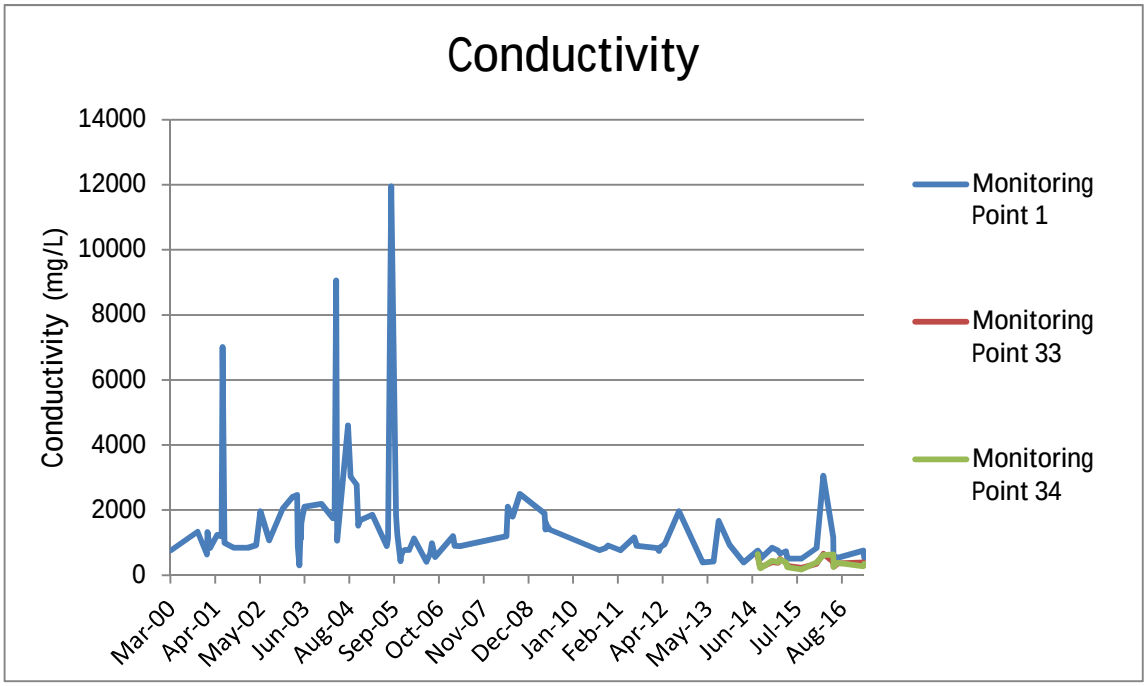
Calcium is an abundant element that is generally found in water through the erosion of rocks. However it is also common in construction materials, such as cement, brick lime and concrete. In March 2016 the annual (not an overflow event) sample resulted in an elevated result for calcium of 190 mg/L which is approximately three times the background trend. As Whytes Gully does not accept construction and demolition waste materials, there are very few anthropogenic sources of calcium into the sediment ponds. Throughout the reporting period calcium levels have returned to historical levels.

Figure 3.1.3.4 Chloride results presentation



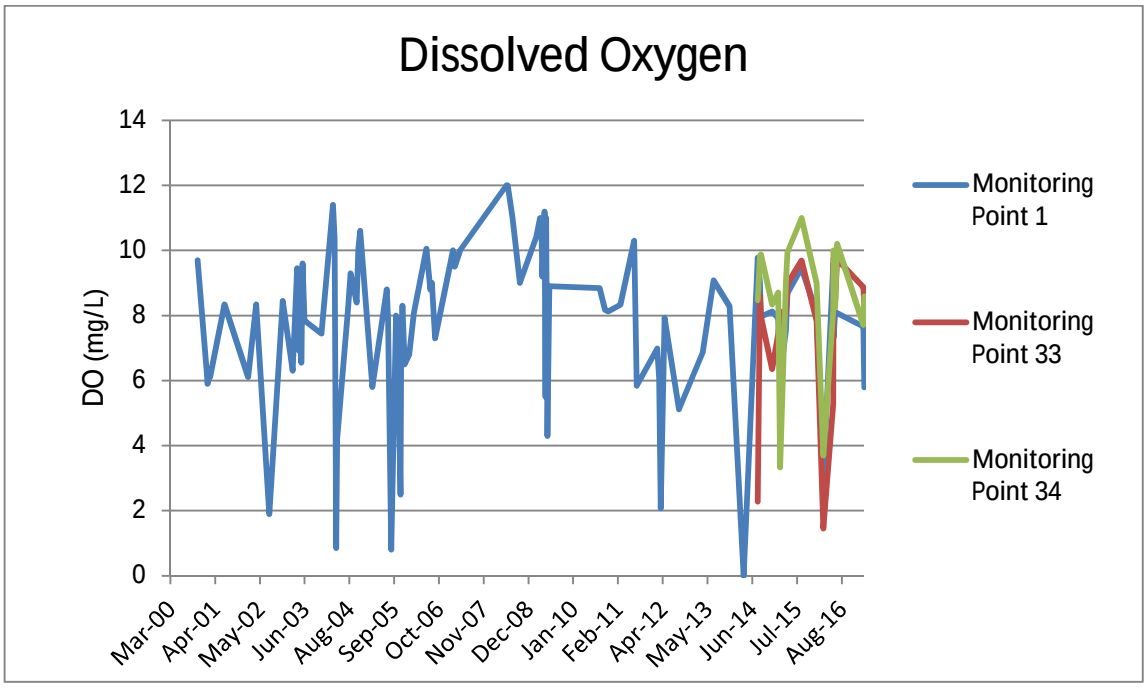
Chloride is present in landfill leachate and is therefore considered to be an indicator of uncontrolled leachate release. The chloride levels in the stormwater pond are consistent with historical results.

Figure 3.1.3.5 Conductivity results presentation



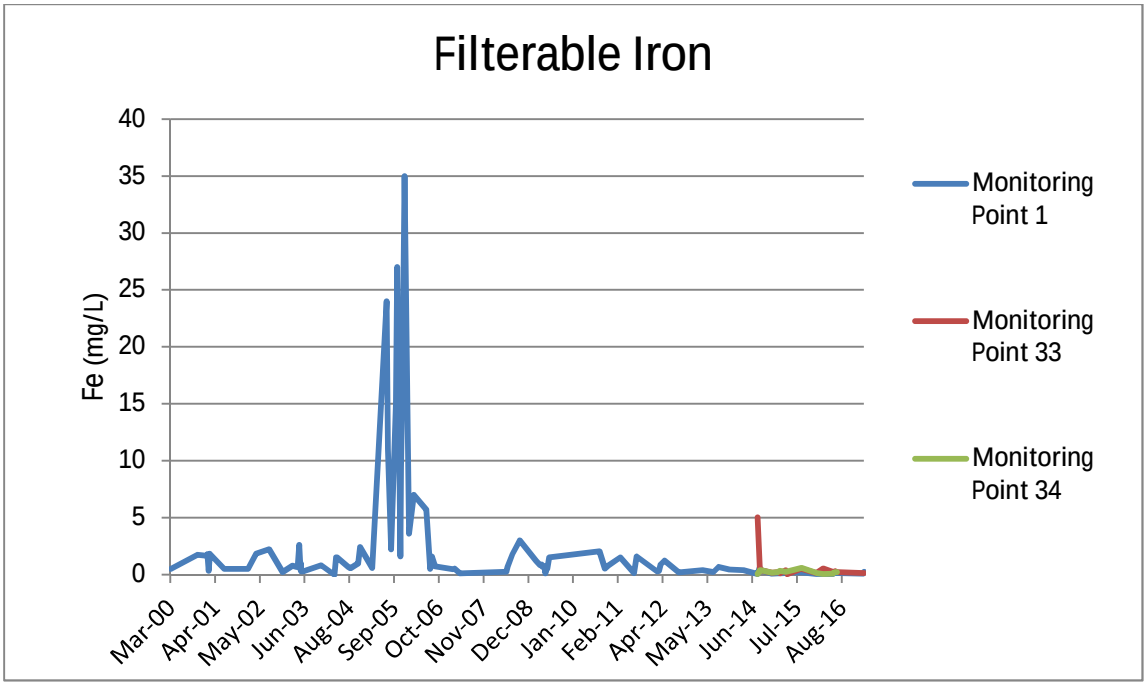
Conductivity is a measure of the waters ability to pass electrical current, usually though positively or negatively charged inorganic dissolved solids. It therefore indirectly measures the presence of inorganic materials including calcium, bicarbonate, nitrogen, phosphorus, iron, sulphur and other ions dissolved in a water body. Low levels of inorganic materials have been found in the sediment pond during the reporting period.

Figure 3.1.3.6 Dissolved oxygen results presentation



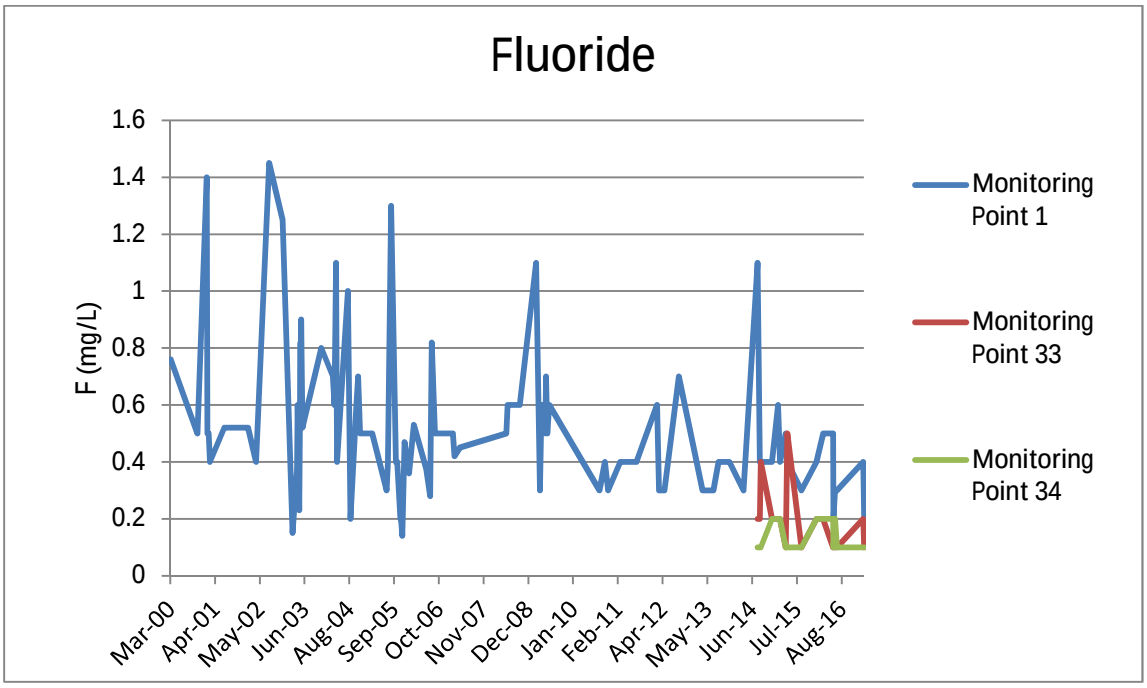
Dissolved oxygen levels can be depleted by biological activity associated with the nitrification process common in landfill leachate. Dissolved oxygen levels have historically fluctuated in the sediment pond. More recent sampling of upstream and downstream locations indicate that the fluctuations experienced over the reporting period are typical of the water body and not impacted by the sediment ponds at the Site.

Figure 3.1.3.7 Filterable iron results presentation



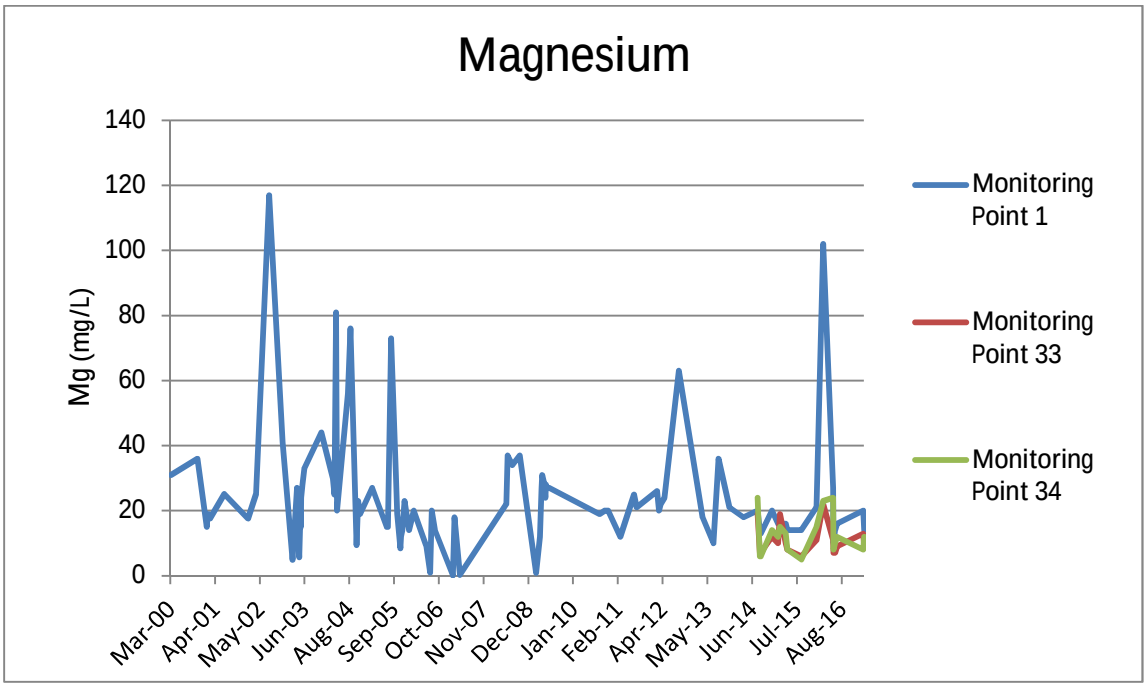
Filterable iron has continued to trend at very low levels, especially with regard to the reporting period.

Figure 3.1.3.8 Fluoride results presentation



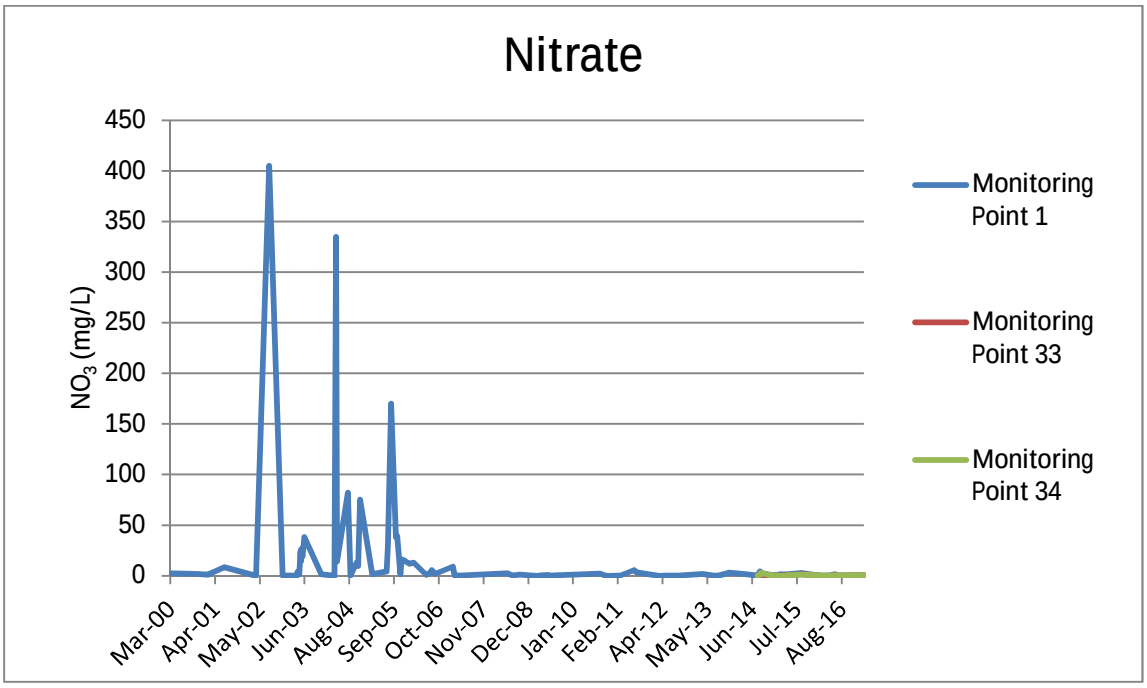
Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L. The level of fluoride found in the stormwater detention pond is therefore by comparison relatively low and displays a consistent trend over the twelve year sampling period. Fluctuations evident are very low actual levels, up to 0.6 mg/L.

Figure 3.1.3.9 Magnesium results presentation



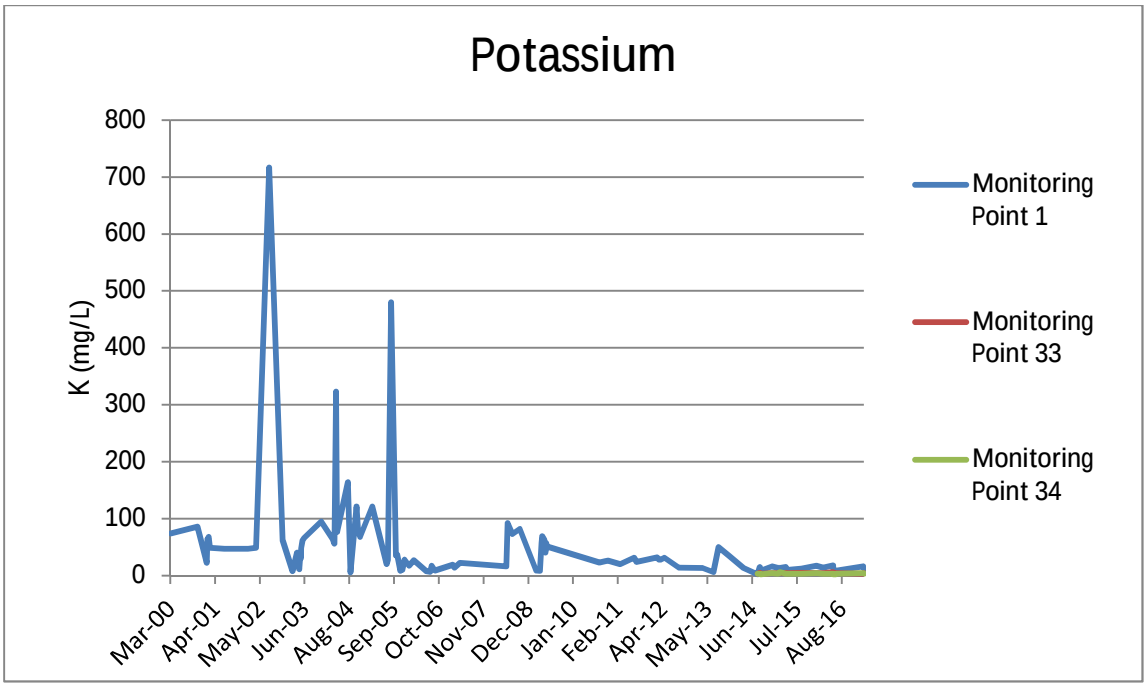
March 2016 the annual (not an overflow event) sample resulted in an elevated result for magnesium of 102 mg/L which is approximately three times the background trend. As Whytes Gully does not accept construction and demolition waste materials, there are very few anthropogenic sources of magnesium into the sediment ponds. Throughout the reporting period magnesium levels have returned to historical levels. The elevated magnesium result is linked with the spike in Calcium (another inorganic dissolved solid common in building and construction materials). Follow up samples have been taken and each indicates that magnesium and calcium levels in the sediment pond have since returned to historic levels.

Figure 3.1.3.10 Nitrate results presentation



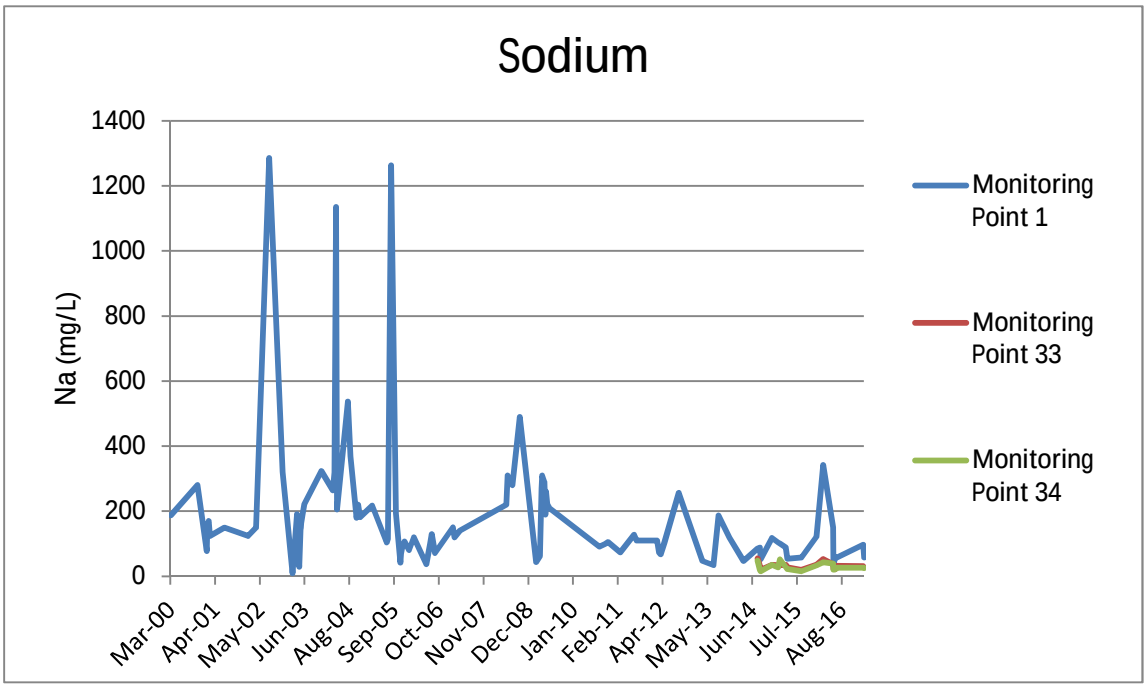
Nitrate and nitrite are naturally occurring ions that are part of the nitrogen cycle that includes the decomposition of organic matter, such as what takes place in landfills. The World Health Organisation suggests that nitrate concentration in surface water is normally up to 18 mg/L. The samples analysed during the reporting period indicate that landfill leachate is unlikely to be intersecting with the sediment ponds.

Figure 3.1.3.11 Potassium results presentation



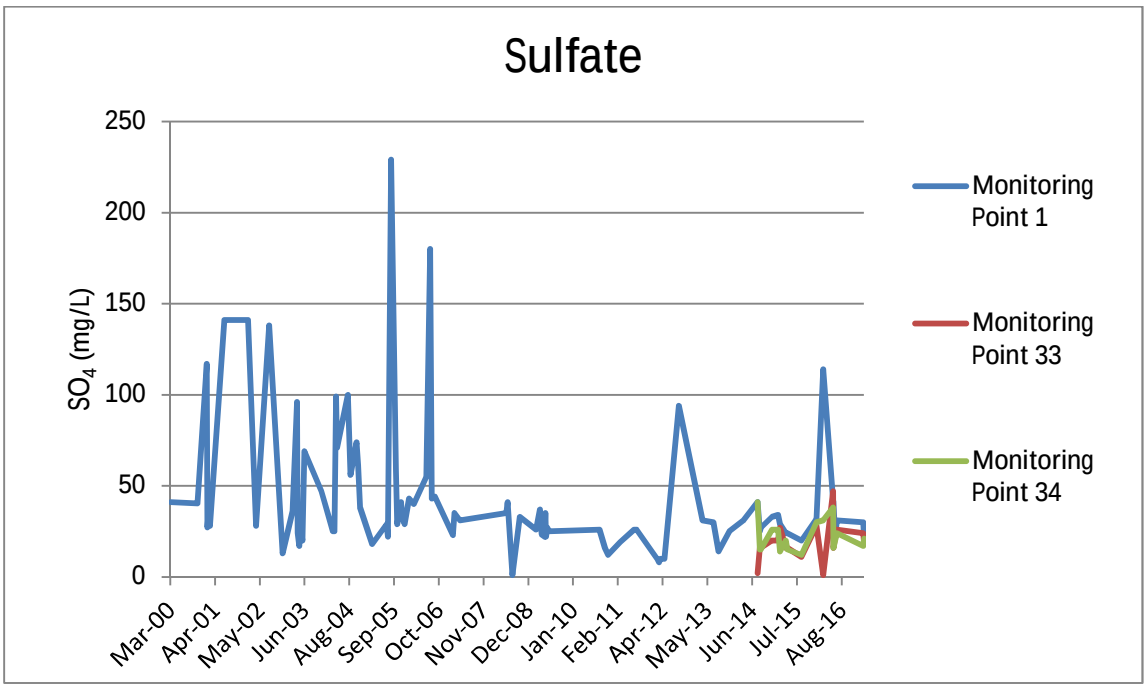
Potassium concentrations have been in line with recent trends and with the naturally occurring groundwater levels of these analytes around the site. Elevated potassium concentrations are typically associated with weathering of rocks.

Figure 3.1.3.12 Sodium results presentation



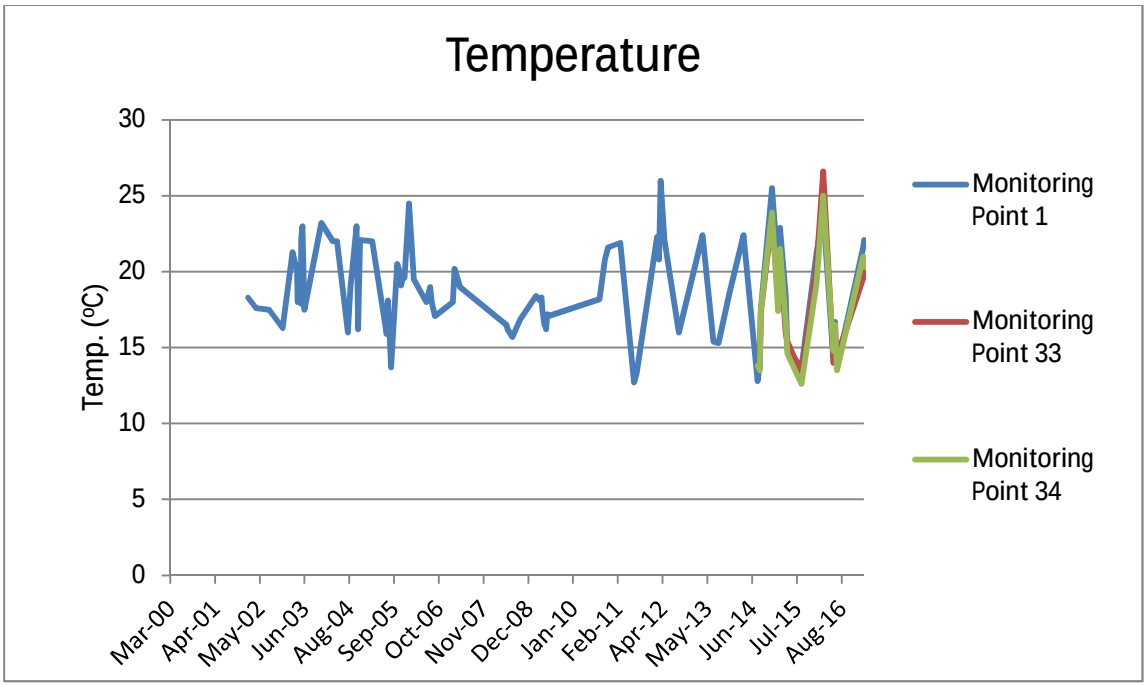
Sodium is common in water bodies due to its high solubility and abundance in rocks and soils. Sodium can provide a potential indicator of groundwater contamination by landfill leachate.

Figure 3.1.3.13 Sulfate results presentation



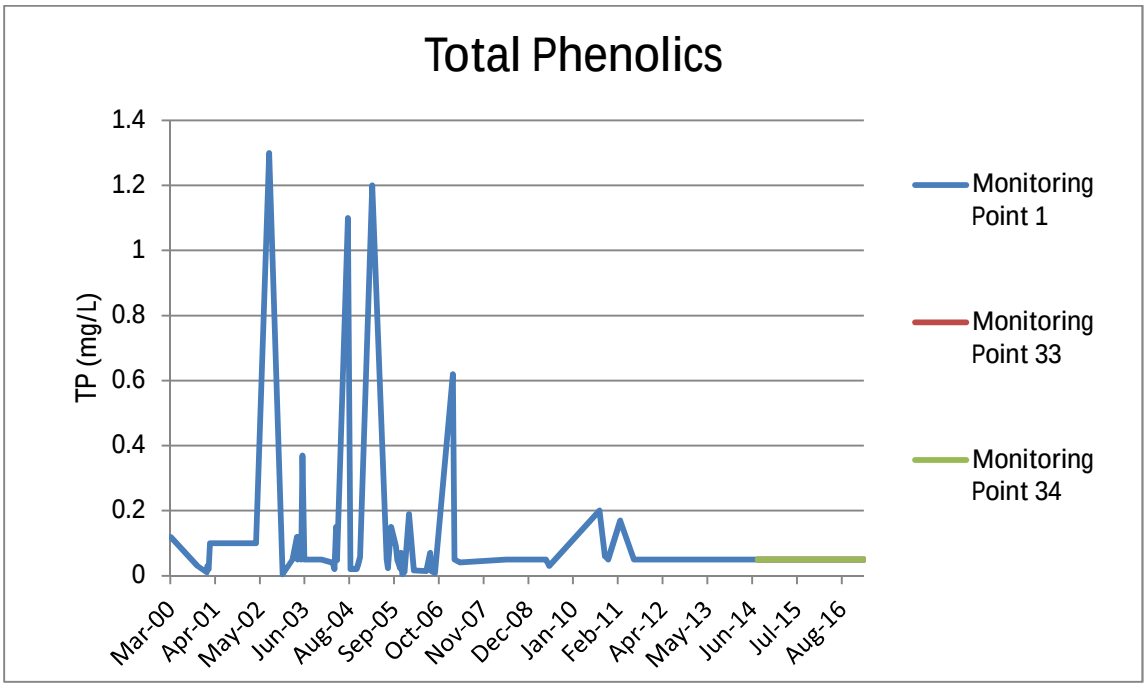
The *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500 mg/L. The sulfate levels in the stormwater detention pond are in line with the historical levels and are better than the drinkable water standard. Inorganic ions such as sulfate provide a potential indicator of groundwater contamination by landfill leachate. A sudden increase in these ions can act as early warning system.

Figure 3.1.3.14 Temperature results presentation



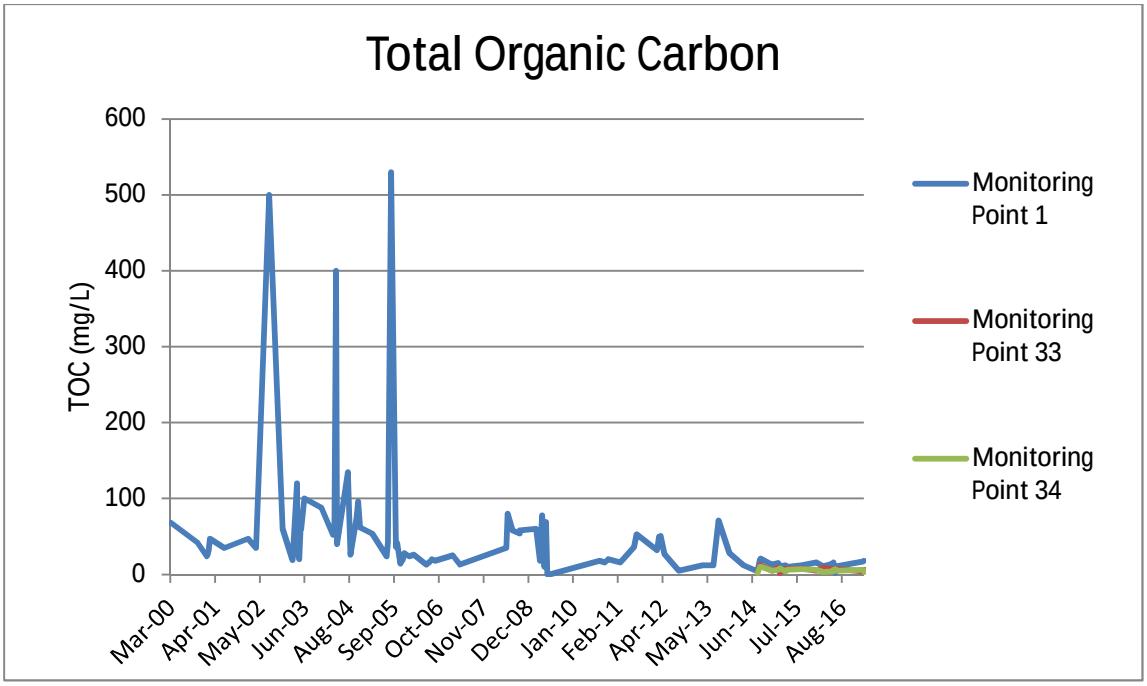
Temperature, as expected has generally been indicative of the season in which the stormwater detention pond has been sampled and mirrors the external environment results upstream and downstream.

Figure 3.1.3.15 Total phenolics results presentation



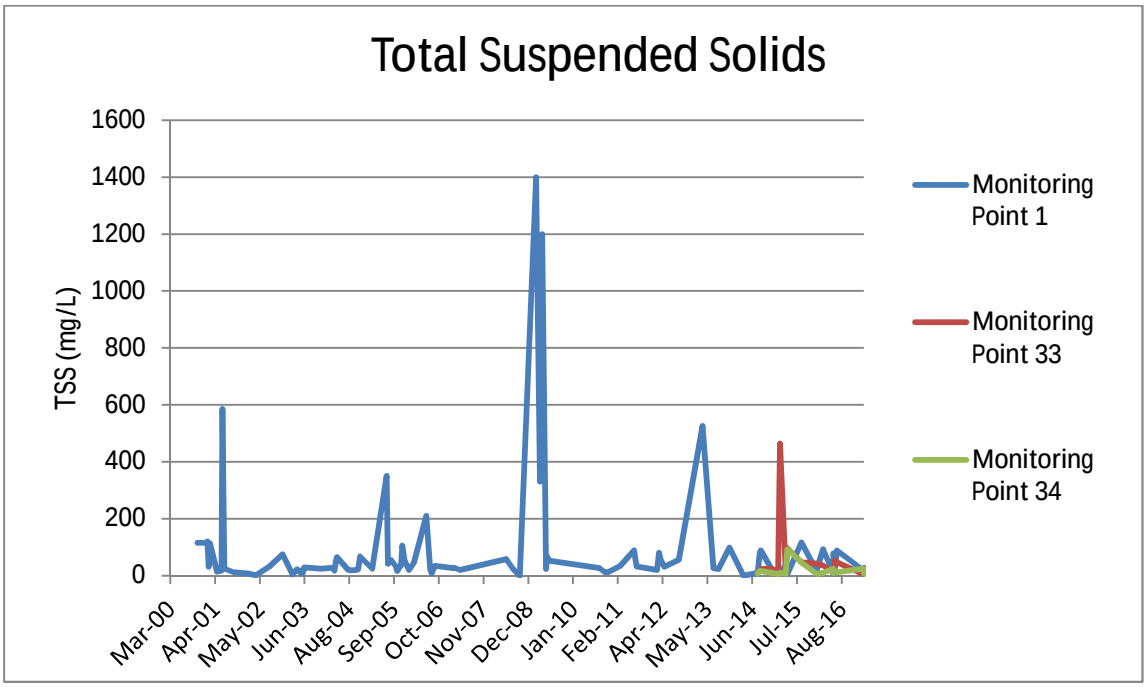
Phenols are widely used in the manufacture of resins, plastics, insecticides, explosives, dyes, and detergents. It is also used as a raw material for the production of medicinal drugs such as aspirin. Recent trend results for total phenols have been extremely low and more often than not, below detectable limits in the stormwater detention pond. In fact, all samples taken during the reporting period were below detectable limits.

Figure 3.1.3.16 Total organic carbon results presentation



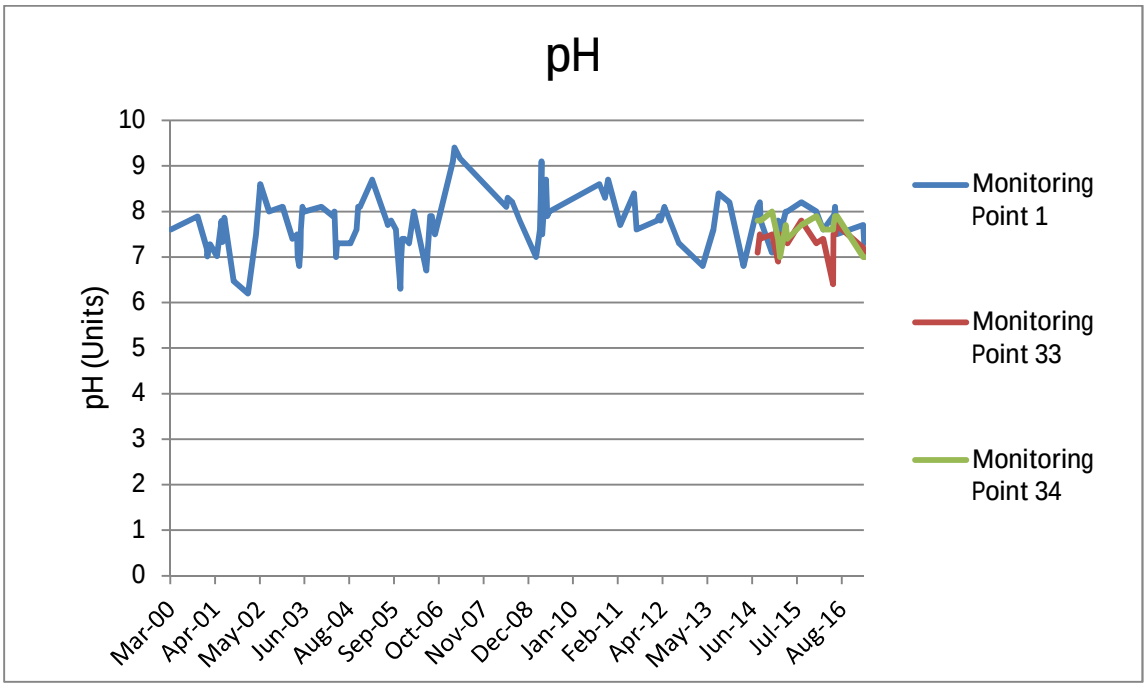
Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of water contamination by natural compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained consistently stable over the last ten years and at very low levels during the reporting period.

Figure 3.1.3.17 Total suspended solids results presentation



Samples for Total Suspended solids indicate that during the reporting period indicate that there has been two (2) non compliances occurred on 7 June 2016 with a result of 78mg/L and 8 July 2016 (88mg/L). Refer to section 4.1 Deficiency identification and remediation.

Figure 3.1.3.18 pH results presentation



Samples during the reporting period for pH show that the values have between the normal ranges of 6.5 – 8.5.

3.1.4 Surface Water Results Interpretation

Whilst the majority of analytical samples taken during the reporting period indicate low contamination levels in the sediment ponds, there has been two (2) non compliances with Environmental Protection Licence requirements associated with higher than acceptable suspended solids exiting the site during heavy rainfall. Whilst not a chemical or biological contamination issue, the result shows that the sediment ponds need additional care and maintenance moving forward. Section 4.1 Deficiency Identification and Remediation further explains the improvements implemented to monitor and manage stormwater on site.

3.2 GROUNDWATER MONITORING

Site investigations resulting from Council's Environment Application lodged with the State Government on 01 April 2012, have confirmed a predominant approximate south-southwest groundwater flow direction. The groundwater flow direction should be used to contextualise monitoring well locations and any elevated results, please refer to the sites Environmental Monitoring Locations located in Annexure A of this document.

3.2.1 Tabulated Results

Table 3.2.1.1 Quarterly analyte testing results for 8 August 2016

Analyte		Monitoring Points															
	Units	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	1200	772	370	495	107	486	318	45	Dry	288	567	263	677	555	256	814
Calcium	mg/L	313	354	96	86	22	174	39	5	Dry	46	126	94	207	119	90	123
Chloride	mg/L	1130	1300	604	621	14	348	50	24	Dry	32	659	368	870	639	434	1090
Conductivity	µS/cm	5200	5160	2660	2880	262	1650	553	212	Dry	620	3080	1540	3970	2990	1710	4810
Magnesium	mg/L	190	214	55	74	6	56	24	2	Dry	17	84	51	152	91	46	119
Nitrogen	mg/L	0.03	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	Dry	0.02	0.01	0.3	<0.01	<0.01	<0.01	0.08
Potassium	mg/L	3	2	<1	<1	1	<1	<1	<1	Dry	5	1	2	1	1	1	<1
Sodium	mg/L	639	530	401	464	20	171	106	31	Dry	68	432	173	486	418	190	818
Water Level	m	4.99	0.5	1.73	2.24	2.5	7.1	7.24	10.8	Dry	2.6	2.1	3.03	4.06	6.27	2.92	1.46
Sulfate	mg/L	156	184	113	193	10	124	39	12	Dry	19	172	103	276	166	24	238
TDS	mg/L	3390	3930	1580	1740	215	1180	422	173	Dry	369	1880	1010	2660	1770	1080	5460
TOC	mg/L	98	10	2	3	2	1	2	1	Dry	10	2	5	2	1	1	9
pH	pH	7.4	7.5	7.6	7.6	7	7.5	7.1	7	Dry	7.5	7.9	5.9	7.7	7.5	7.2	7.5

Table 3.2.1.2 Quarterly analyte testing results for 28 November 2016

Analyte		Monitoring Points															
	Units	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	1060	671	420	336	247	444	453	Dry	594	414	473	358	603	494	218	725
Calcium	mg/L	311	351	81	98	65	164	55	Dry	64	50	125	84	194	116	91	128
Chloride	mg/L	1220	1390	640	645	20	374	90	Dry	408	360	675	247	902	670	438	1170
Conductivity	µS/cm	5620	5640	2980	2800	545	1950	1260	Dry	3550	1870	3140	1540	4340	2320	1780	5100
Magnesium	mg/L	189	206	73	59	17	68	38	Dry	65	42	84	38	150	93	47	127
Nitrogen	mg/L	<0.01	0.03	0.02	<0.01	0.04	0.01	0.22	Dry	0.04	0.04	0.01	1.16	<0.01	0.03	0.05	0.21
Potassium	mg/L	2	2	<1	<1	<1	<1	<1	Dry	3	<1	<1	2	1	1	2	<1
Sodium	mg/L	622	515	465	414	29	159	176	Dry	635	312	422	164	463	418	190	819
Water Level	m	5.1	0.69	2.5	1.97	7	7.9	7.8	Dry	5.3	2.79	2.28	3.7	4.21	6.4	3.23	1.53
Sulfate	mg/L	150	123	119	189	13	114	45	Dry	596	83	175	45	262	152	22	47
TDS	mg/L	3330	3500	1530	1650	628	1150	809	Dry	2100	1100	1760	858	2510	1690	948	3060
TOC	mg/L	7	5	<1	4	5	3	3	Dry	4	6	14	14	4	25	6	10
pH	pH	7.8	7.1	6.8	6.7	7	6.7	7.4	Dry	8.2	6.7	7.1	6.4	6.9	7	7	6.6

Table 3.2.1.3 Quarterly analyte testing results for 6 February 2017

Analyte		Monitoring Points															
	Units	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	1160	809	362	448	Dry	479	523	39	Dry	576	512	227	638	571	239	771
Calcium	mg/L	300	369	97	77	Dry	224	55	8	Dry	140	124	90	198	126	92	121
Chloride	mg/L	1150	1330	605	606	Dry	525	83	37	Dry	686	646	376	875	669	437	1100
Conductivity	µS/cm	5700	5940	3000	3200	Dry	2700	1300	289	Dry	3620	3330	1780	4400	3470	1810	5350
Magnesium	mg/L	192	214	58	72	Dry	75	39	3	Dry	125	84	51	154	100	47	121
Nitrogen	mg/L	0.02	0.02	0.02	0.02	Dry	0.05	0.18	0.12	Dry	0.04	0.01	0.51	0.01	0.06	0.05	0.26
Potassium	mg/L	3	2	<1	<1	Dry	<1	<1	<1	Dry	<1	<1	2	2	1	1	<1
Sodium	mg/L	609	491	399	456	Dry	184	176	36	Dry	441	417	169	457	421	187	755
Water Level	m	5.36	0.92	2.28	2.72	Dry	7.4	7.8	10.9	Dry	1.88	2.5	4.01	4.4	6.5	3.46	1.65
Sulfate	mg/L	168	193	174	206	Dry	149	74	14	Dry	204	189	100	288	210	24	244
TDS	mg/L	3840	4390	1620	1920	Dry	2140	1180	543	Dry	2540	2020	1820	3080	2230	1340	3210
TOC	mg/L	7	6	2	2	Dry	2	3	4	Dry	3	2	13	3	3	2	11
pH	pH	6.6	6.9	6.7	7	Dry	7	7.5	5.9	Dry	6.8	6.9	6.1	6.8	6.9	6.9	6.7

Table 3.2.1.4 Quarterly analyte testing results for 8 May 2017

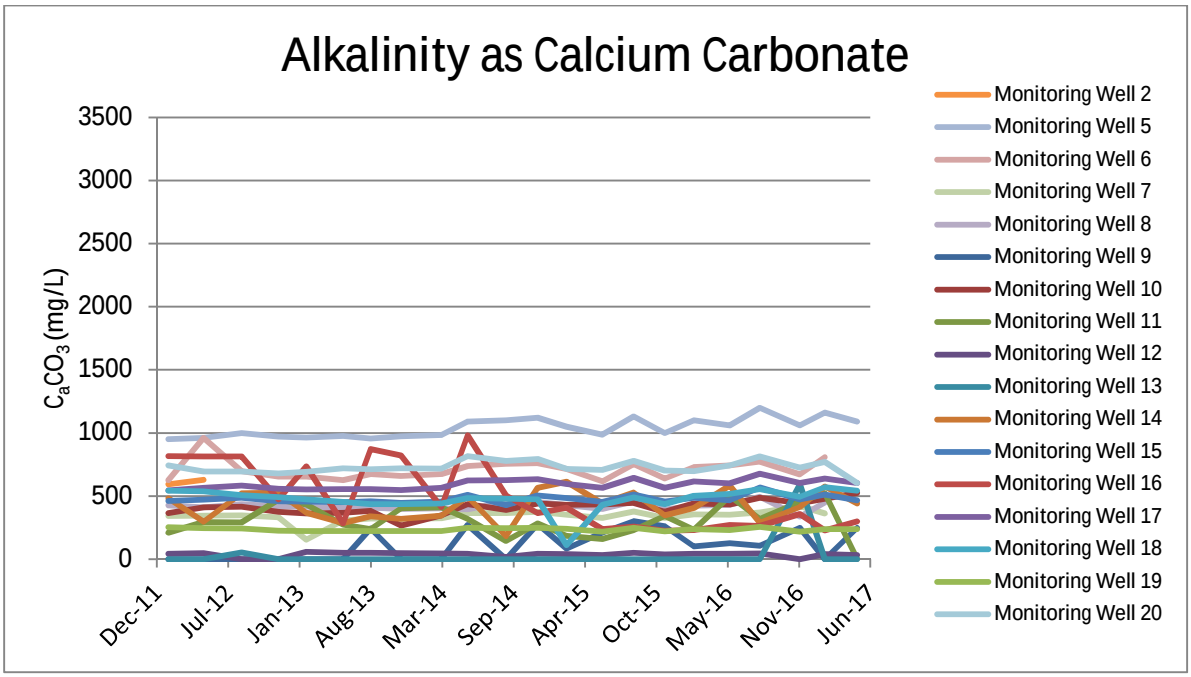
Analyte		Monitoring Points															
	Units	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	1090	*	*	*	248	237	<1	32	DRY	442	466	300	602	542	238	604
Calcium	mg/L	360	*	*	*	60	162	40	7	DRY	147	111	95	228	130	92	91
Chloride	mg/L	1180	*	*	*	22	237	250	41	DRY	548	621	319	917	667	413	902
Conductivity	µS/cm	5710	*	*	*	559	1840	893	271	DRY	2560	3060	1620	4440	3400	1690	3930
Magnesium	mg/L	170	*	*	*	15	50	18	3	DRY	82	81	47	138	86	40	100
Nitrogen	mg/L	0.02	*	*	*	0.05	<0.01	<0.01	0.01	DRY	0.1	0.04	0.5	<0.01	0.01	0.04	0.16
Potassium	mg/L	2	*	*	*	<1	<1	<1	<1	DRY	3	2	2	1	1	1	<1
Sodium	mg/L	558	*	*	*	26	156	74	33	DRY	246	397	154	434	389	164	687
Water Level	m	10.9	*	*	*	11.68	7.59	7.04	10.65	DRY	2.5	2.03	3.21	3.97	6.7	2.9	1.39
Sulfate	mg/L	152	*	*	*	9	120	250	14	DRY	132	159	105	262	157	24	171
TDS	mg/L	3390	*	*	*	505	998	456	300	DRY	1380	1680	840	2570	1720	758	2180
TOC	mg/L	6	*	*	*	3	1	2	2	DRY	4	3	7	4	2	<1	10
pH	pH	6.8	*	*	*	7.1	7.2	6.3	5.7	DRY	6.9	6.6	6.4	6.8	7.1	7.1	6.5

*Note: Well decommissioned 28 February 2017

3.2.2 Data Presentation – Quarterly Monitoring

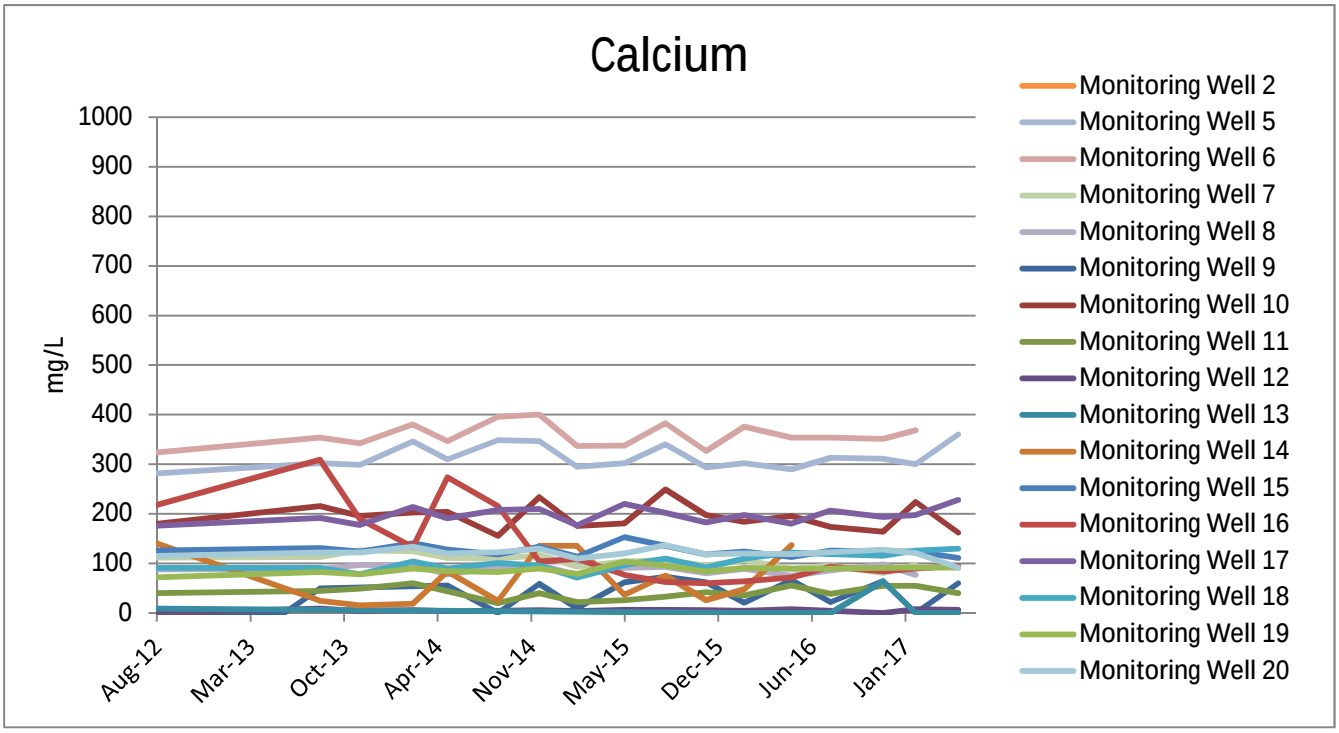
NOTE: Monitoring points 2, 6, 7 and 8 were decommissioned in February 2017.

Figure 3.2.2.1 Alkalinity results presentation



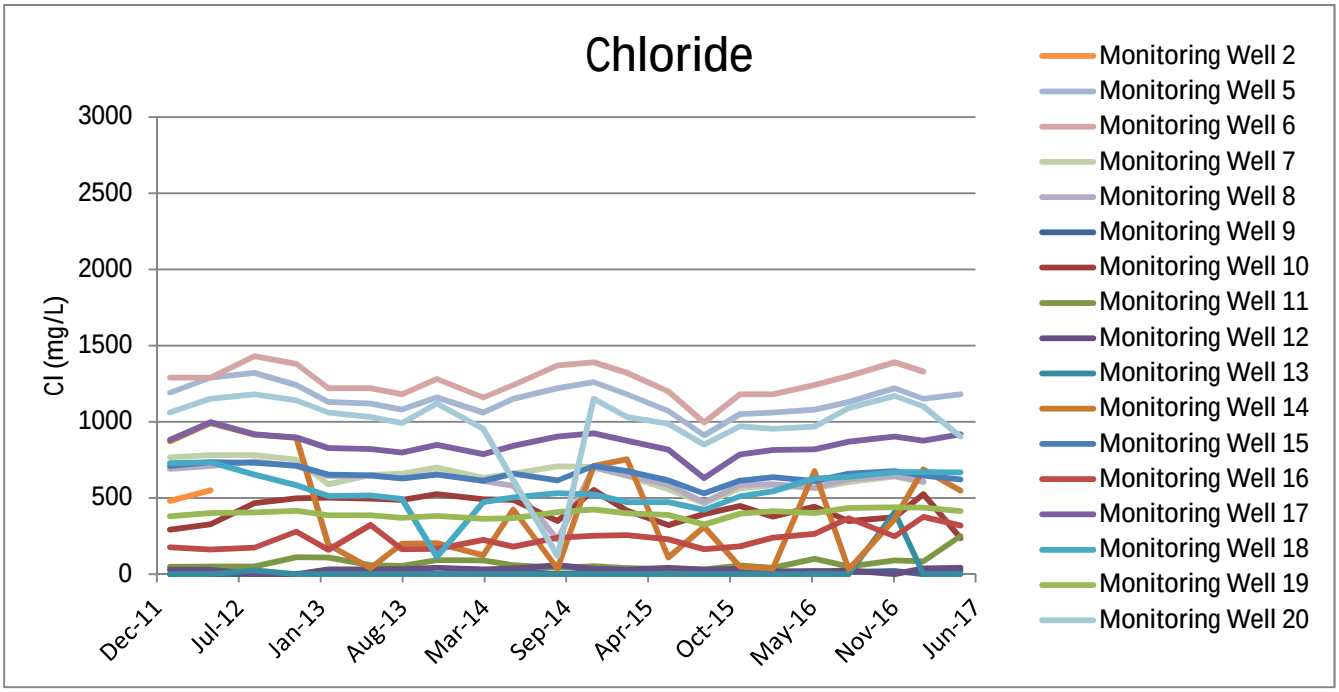
Increased alkalinity levels can be caused by many chemical processes including the denitrification process common in landfill leachate. Denitrification is the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. This process produces calcium carbonate as a by-product. The stability of the calcium carbonate in the groundwater monitoring wells over the sample period shows that it is unlikely that the denitrification process caused by leachate ingress is taking place in the groundwater around the site. Nonetheless, the calcium carbonate levels are relatively high and quite "hard" in plumbing terms and continued monitoring is necessary to scrutinise for any increased value trends. It should be noted that many natural groundwater sources often contain much higher alkalinity levels than this site.

Figure 3.2.2.2 Calcium results presentation



The groundwater monitoring wells show a consistent trend for calcium levels. The calcium levels sampled would be considered “hard” water in the region of 120-180mg/L. This is consistent with the presented results for alkalinity.

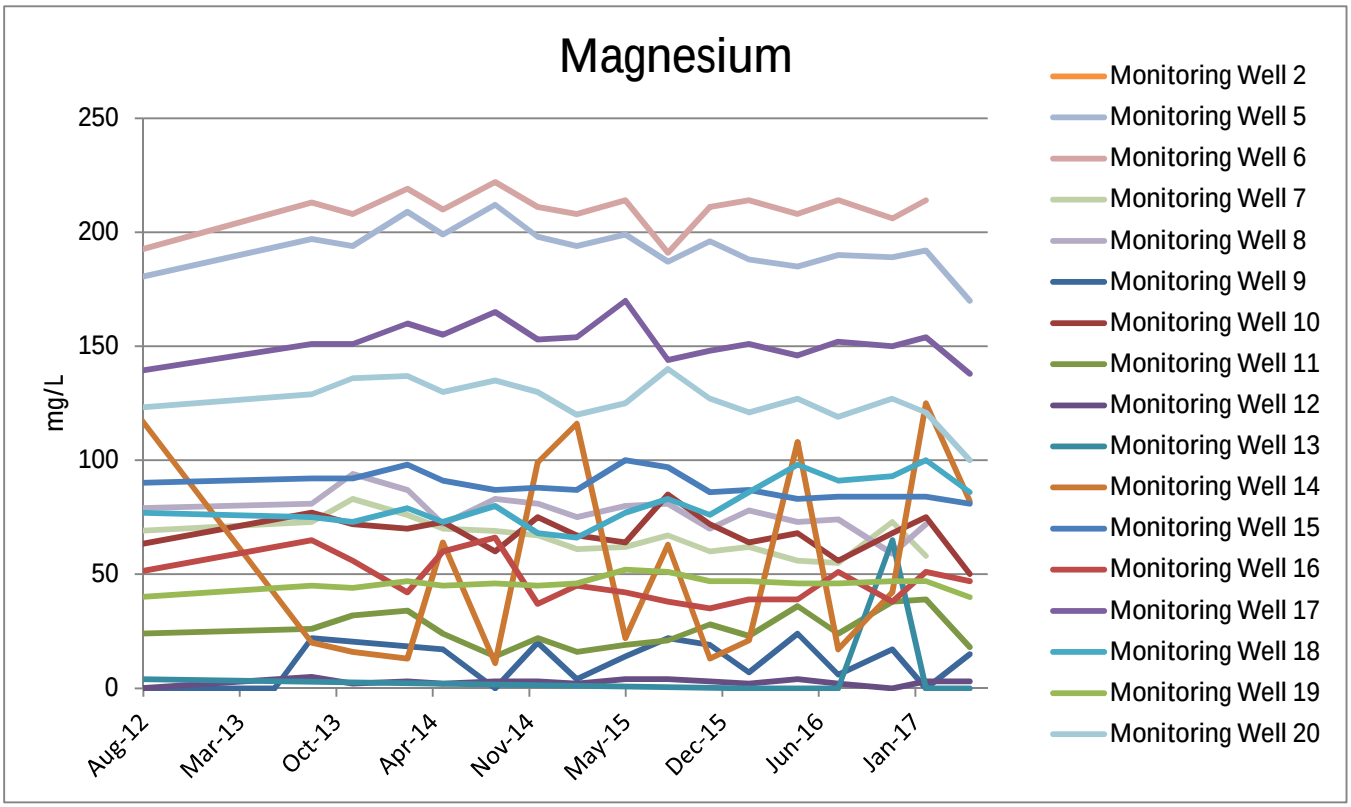
Figure 3.2.2.3 Chloride results presentation



The trends realised through chloride monitoring have been in line with the historical levels over the data range available. Large quantities of inorganic ions such as chloride can be an indicator of

leachate contamination of groundwater. A sudden increase in these ions can act as early warning system. The sampling history for chloride suggests that no significant spikes have occurred that are not within historical fluctuation levels and therefore leachate is not indicated in the groundwater network.

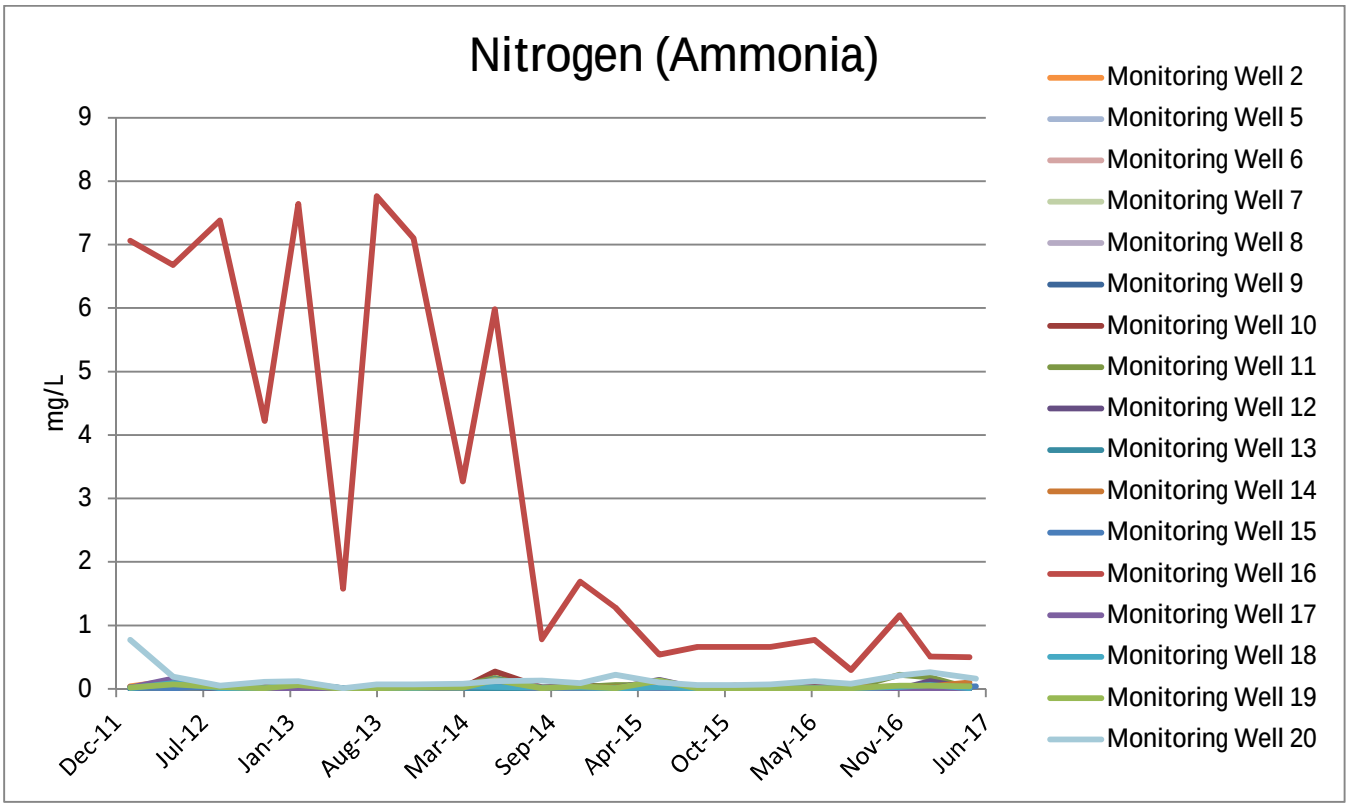
Figure 3.2.2.4 Magnesium results presentation



Monitoring well results are in line with historical levels and have maintained consistent levels. The magnesium levels sampled would be considered quite “hard” and consistent with other typical water hardness measures such as alkalinity and calcium.

Monitoring well 14 has demonstrated the most instability over the five year sampling period. However, all other wells appear relatively stable.

Figure 3.2.2.5 Nitrogen as ammonia results presentation

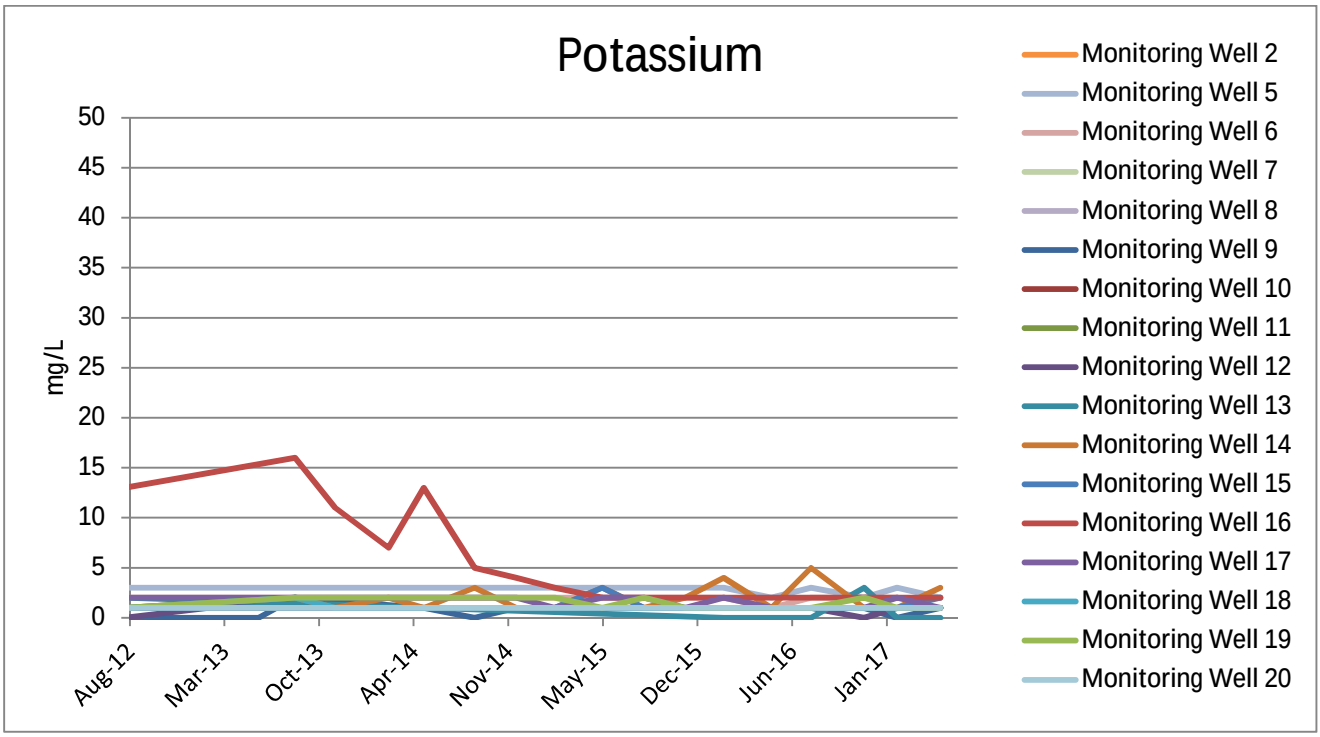


Ammonia is found in the environment, in the air, soil and water; in plants and animals. It is formed naturally by the decomposition of urine and manure. It is a source of nitrogen which is needed by plants and animals.

The monitoring wells indicate that ammonia levels in the groundwater are extremely low and often beneath the testing limits. However, monitoring point 16 has indicated a relatively higher result level. Considering that monitoring points 16 and 19 are arguably the most relevant with regard to groundwater movement away from the site, the result must continue to be monitored closely. Ammonia is arguably the clearest indicator of leachate contamination and the results from well 16 should continue to be monitored in future sampling events to be sure that the relative higher levels found prior to September 2014 are not indicative of leachate migration.

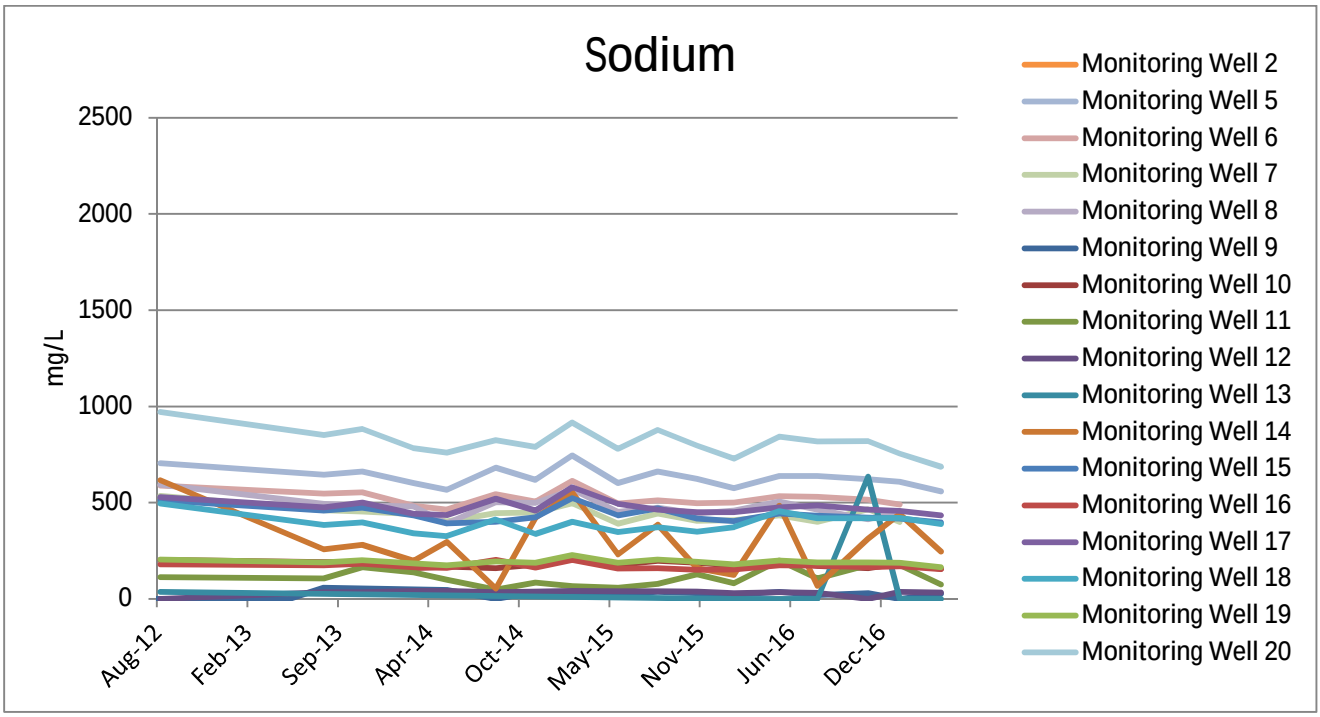
The data established over the reporting period indicates that ammonia levels in well 16 have started to stabilise at a low level of less than 1 mg/L, noting that up to 0.5 mg/L is considered suitable in drinking water.

Figure 3.2.2.6 Potassium results presentation



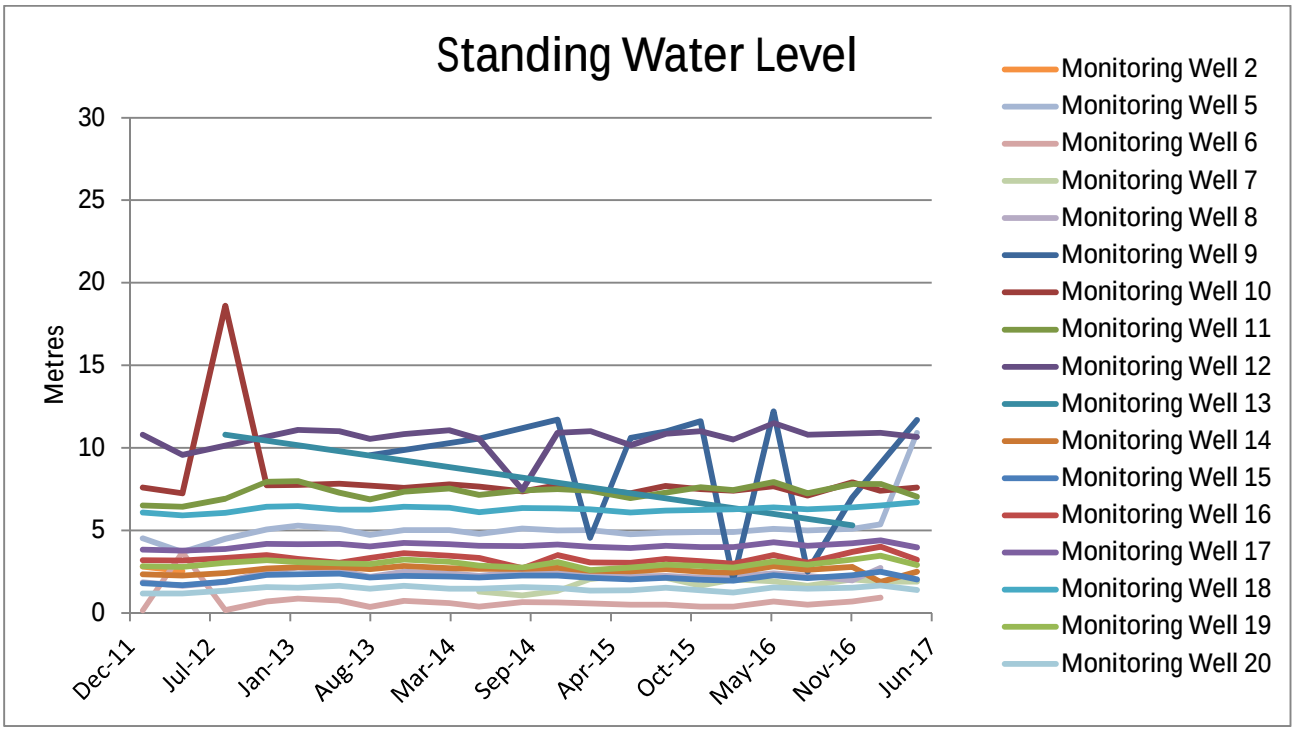
Potassium is present in groundwater systems outside coastal areas generally through weathering of clays and as a result of agriculture (leaching of fertiliser). Potassium may also be present in the breakdown of glass and especially cathode ray tubes. Groundwater monitoring wells indicate that potassium levels in the ground water are generally low over the available results period. Monitoring point 16 was reading higher than all other wells, but again is showing a positive overall downward trend.

Figure 3.2.2.7 Sodium results presentation



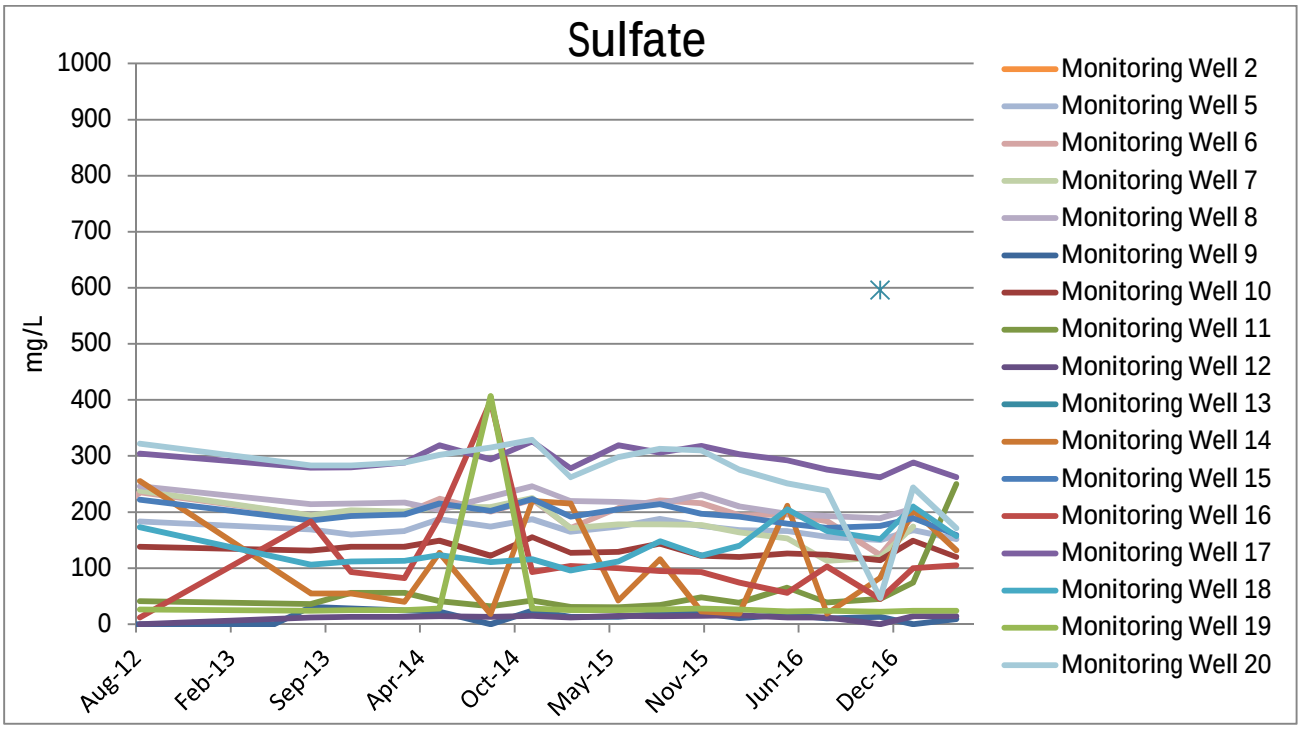
High sodium levels can be indicative of leachate contamination infiltrating the groundwater. As presented, results for sodium over the reporting period have been in line with historical fluctuations experienced throughout the history of data available.

Figure 3.2.2.8 Standing water level presentation



Groundwater level trends have been fairly stable, with the fluctuation over the six year testing period. It should be noted that some wells have run dry at periods, whilst well 13 appears to be permanently dry.

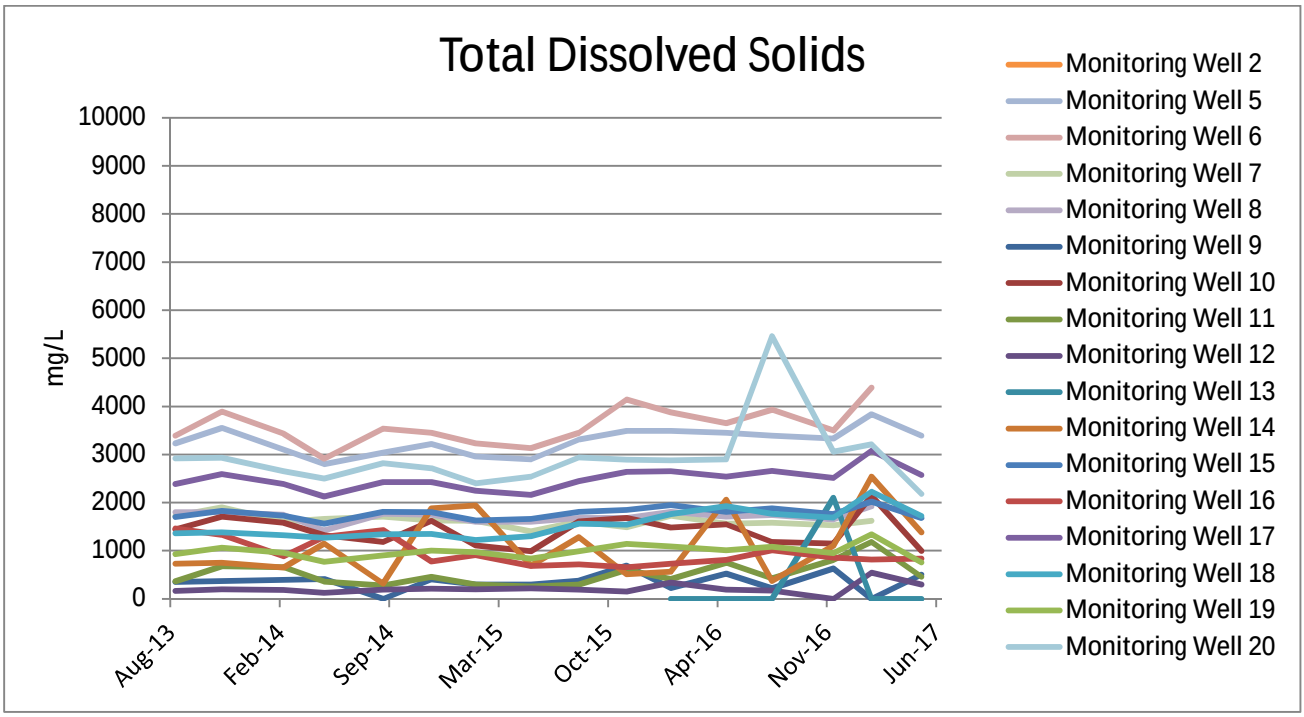
Figure3.2.2.9 Sulfate results presentation



For context the *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500 mg/L. The sulfate levels in the groundwater monitoring wells are in line with the historical levels experienced at the Site and are generally better than the drinkable water standard. Inorganic ions such as sulfate provide a good indication of groundwater contamination by landfill leachate.

Monitoring point 13 spiked in November 2016. Further sampling in February and May 2017 shows that Monitoring Point 13 has stabilised and the November 2016 result was potentially an anomaly.

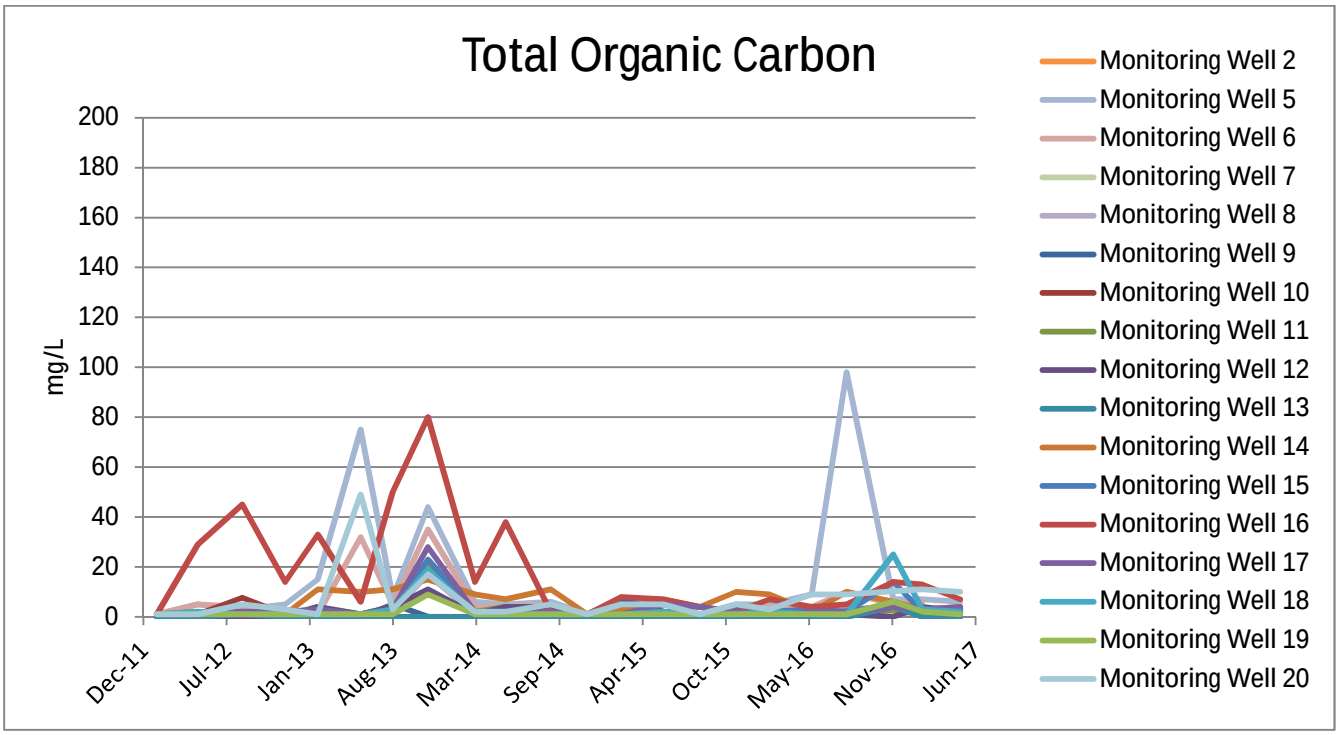
Figure 3.2.2.10 Total dissolved solids results presentation



The trend for the quantity of dissolved solids has been fairly stable for the ground water monitoring wells over the reporting period, in line with historical trends. High levels of dissolved solids can be sourced from salts derived from leachate infiltration.

Monitoring Point 20 spiked in August 2016. Further testing has seen the results within historical data records.

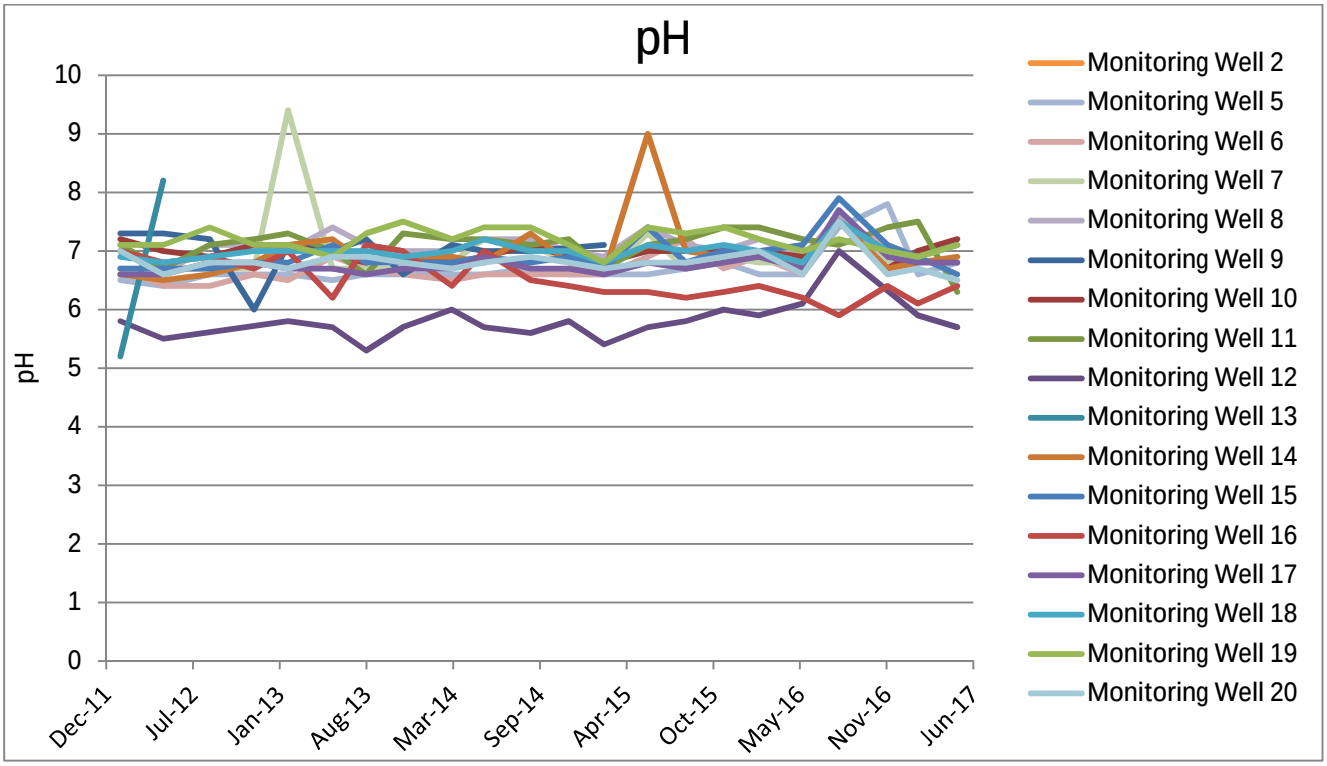
Figure 3.2.2.11 Total organic carbon results presentation



Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of groundwater contamination by organic compounds derived from the landfilling of organic materials. The amount of total organic carbon has remained relatively stable over recent years.

Monitoring Point 5 spiked in August 2016. Further sampling in November 2016, February and May 2017 indicates that TOC levels have since returned to be in line with historical data for this bore.

Figure 3.2.2.12 pH results presentation



The pH levels indicated in the groundwater monitoring wells have been extremely stable over the review period. The fluctuations have been very small except with minor anomalies that invariably return to a stable trend. The groundwater monitoring wells indicate that the historical pH of the groundwater has been maintained for over approximately six years.

3.2.3 Tabulated Results – Annual Monitoring

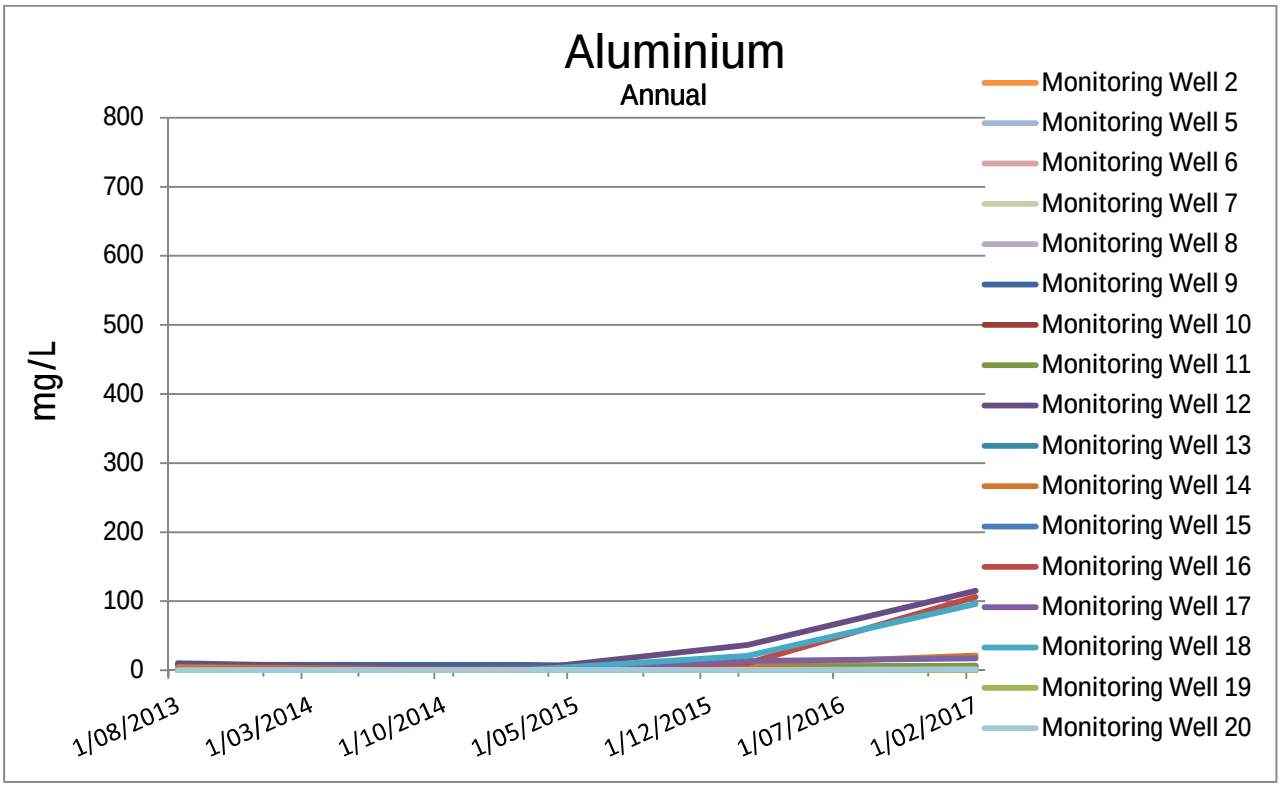
Note: Monitoring Point 2 was located in a construction zone and did not exist on site during the monitoring period. It has been removed from the sites Environment Protection. Monitoring Point 13 was dry and unable to produce a sample.

Table 3.2.3.1 Annual analyte testing results for 6 February 2017. *Note: Well destroyed

Analyte	Units	Monitoring Points															
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aluminium	mg/L	3.37	0.13	1.44	2.73	Dry	6.34	673	115	Dry	21.4	0.12	106	17	96.2	0.24	1.44
Arsenic	mg/L	<0.001	<0.001	0.002	<0.001	Dry	0.001	0.018	0.006	Dry	0.001	<0.001	0.013	0.001	0.018	<0.001	0.002
Barium	mg/L	0.016	0.012	0.073	0.099	Dry	0.052	0.624	0.501	Dry	0.22	0.013	1.65	0.051	0.198	0.145	0.073
Benzene	µg/	<1	<1	<1	<1	Dry	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<2	<1
Cadmium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	Dry	<0.0001	0.002	0.0004	Dry	<0.0001	<0.0001	0.0033	<0.0001	0.0006	<0.0001	<0.0001
Chromium (hex.)	mg/L	<0.01	<0.01	<0.01	<0.01	Dry	<0.01	<0.01	<0.01	Dry	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (total)	mg/L	0.003	<0.001	<0.001	0.002	Dry	0.007	0.305	0.068	Dry	0.017	<0.001	0.17	0.012	0.045	<0.001	0.002
Cobalt	mg/L	0.001	0.002	<0.001	0.005	Dry	0.009	0.448	0.048	Dry	0.009	<0.0001	0.195	0.01	0.075	<0.001	0.019
Copper	mg/L	0.01	0.002	0.002	0.011	Dry	0.028	0.962	0.179	Dry	0.041	0.003	0.474	0.022	0.209	0.004	0.004
Ethyl Benzene	µg/L	<2	<2	<2	<2	Dry	<2	<2	<2	Dry	<2	<2	<2	<2	<2	<2	<2
Fluoride	mg/L	0.5	0.4	0.4	0.9	Dry	0.3	0.7	0.2	Dry	0.6	0.6	<0.1	0.4	0.4	0.4	0.9
Lead	mg/L	0.003	<0.001	<0.001	0.003	Dry	0.014	0.23	0.073	Dry	0.013	<0.001	0.19	0.008	0.082	0.002	0.01
Manganese	mg/L	0.096	0.335	0.011	0.241	Dry	0.517	21.2	2.42	Dry	0.315	0.006	7.32	0.434	2.98	0.352	2.84
Mercury	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	Dry	<0.0001	<0.0001	0.0004	Dry	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001
Nitrate	mg/L	<0.01	<0.01	<0.01	<0.01	Dry	<0.01	0.02	0.85	Dry	0.01	<0.01	<0.01	0.35	<0.01	0.13	<0.010.02
Nitrite	mg/L	<0.01	<0.01	<0.01	<0.01	Dry	<0.01	0.02	0.03	Dry	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01
OCP	µg/	<0.5	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
OPP	µg/	<0.5	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAH	µg/	<1	<1	<1	<1	Dry	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/	<2	<2	<2	<2	Dry	<2	<2	<2	Dry	<2	<2	<2	<2	<2	<2	<2
TPH	µg/	<50	<50	<50	<50	Dry	<50	<50	<50	Dry	<50	<50	<50	<50	<50	<50	<50
Total Phenolics	mg/L	<0.05	<0.05	<0.05	<0.05	Dry	<0.05	<0.05	<0.05	Dry	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene	µg/	<2	<2	<2	<2	Dry	<2	<2	<2	Dry	<2	<2	<2	<2	<2	<2	<2
Zinc	mg/L	0.024	0.006	0.01	0.019	Dry	0.045	1.7	0.31	Dry	0.053	0.005	1.03	0.051	0.376	0.019	0.01

3.2.4 Data Presentation – Annual Monitoring

Figure 3.2.4.1 Aluminium results presentation

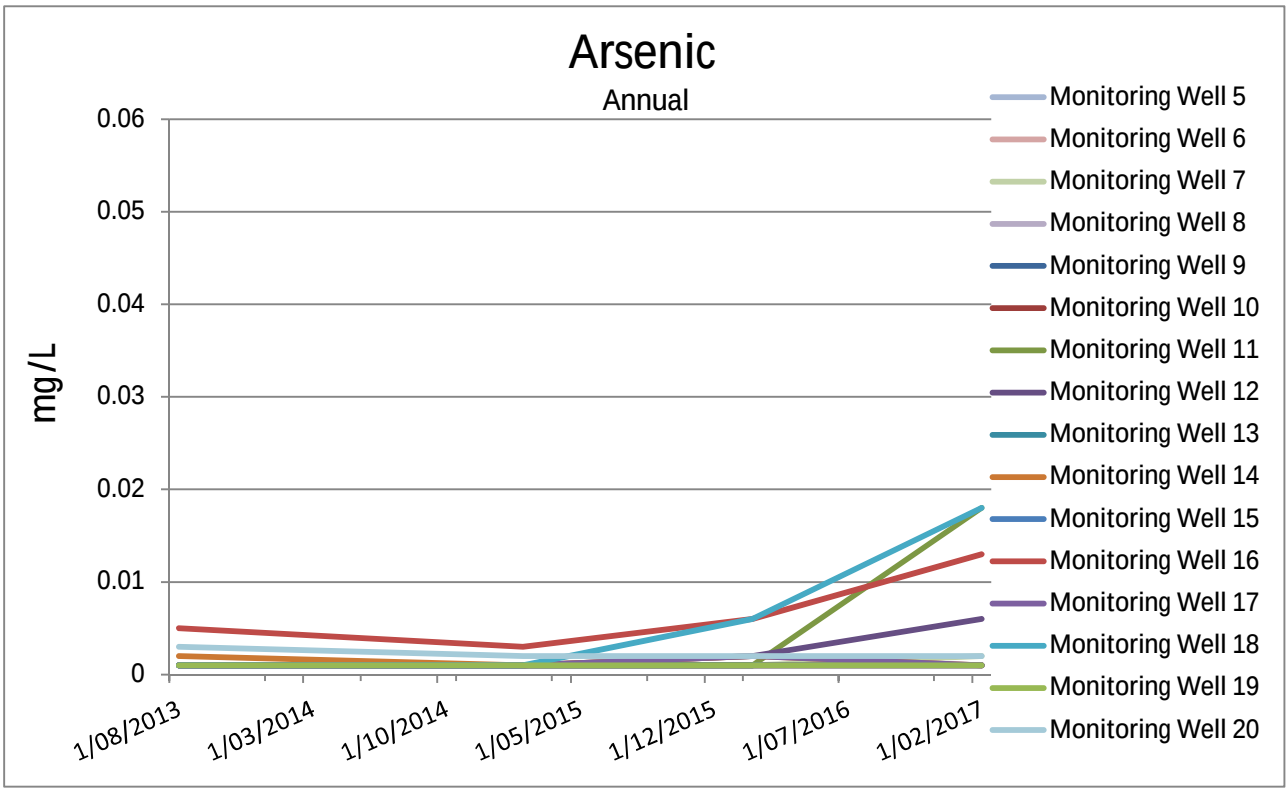


Aluminium levels in the sampled groundwater monitoring points 12 (115mg/l), 16 (106mg/l) and 18 (96.2mg/L) are relatively higher than the other point's on site. Whilst aluminium is naturally abundant in rocks and soil (third most abundant element in the earth's crust), anthropogenic releases are typically in the form of air emissions, waste water effluents, and solid waste primarily associated with industrial processes, such as aluminium production.

Monitoring well 12 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing.

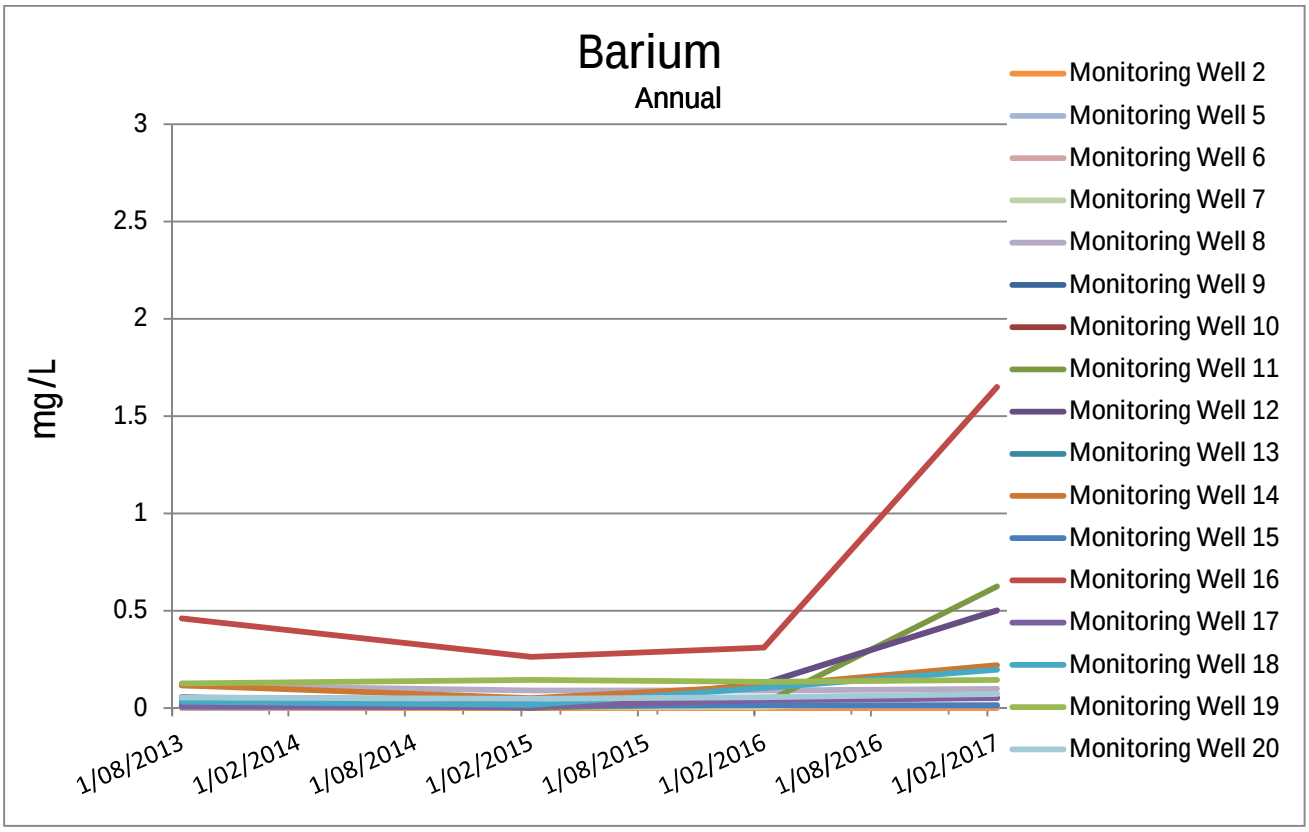
Monitoring well 16 & 18 are located outside the Western boundary of the site, but will be further monitored in the next sampling period.

Figure 3.2.4.2 Arsenic results presentation



The US EPA sets the maximum contaminant level of arsenic in groundwater at 0.05mg/L. Therefore amount of arsenic found in the groundwater monitoring wells over the reporting period is considered to be extremely low. In fact arsenic levels are below detectable limits (0.001 mg/L) in the majority of the test results.

Figure 3.2.4.3 Barium results presentation

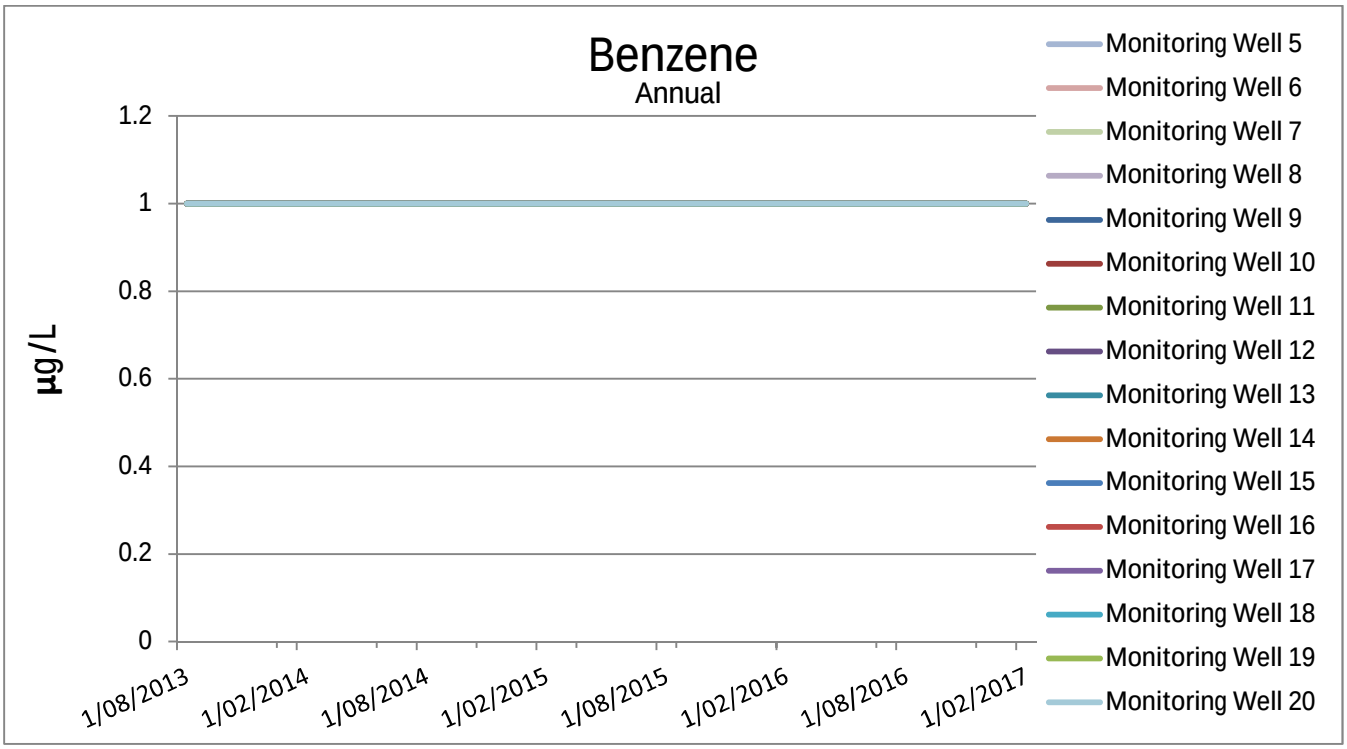


Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, ceramics, glass, and rubber.

The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 2 mg/L of barium is safe for consumption. Barium levels are therefore extremely low overall in the sites groundwater.

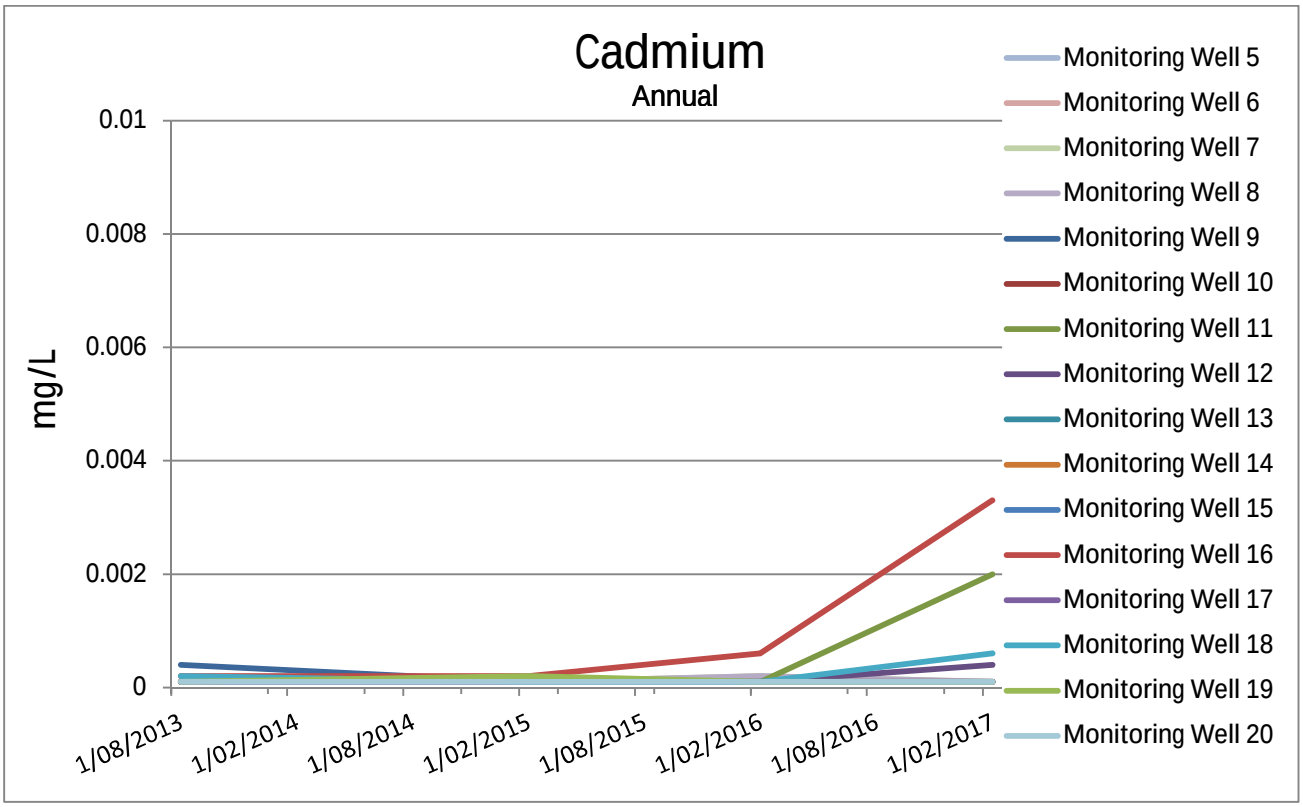
The February 2017 result whilst relatively high is still quite low when compared to Drinking Water Guidelines. Future rounds of testing will be used to determine if the result is anomalous or not.

Figure 3.2.4.4 Benzene results presentation



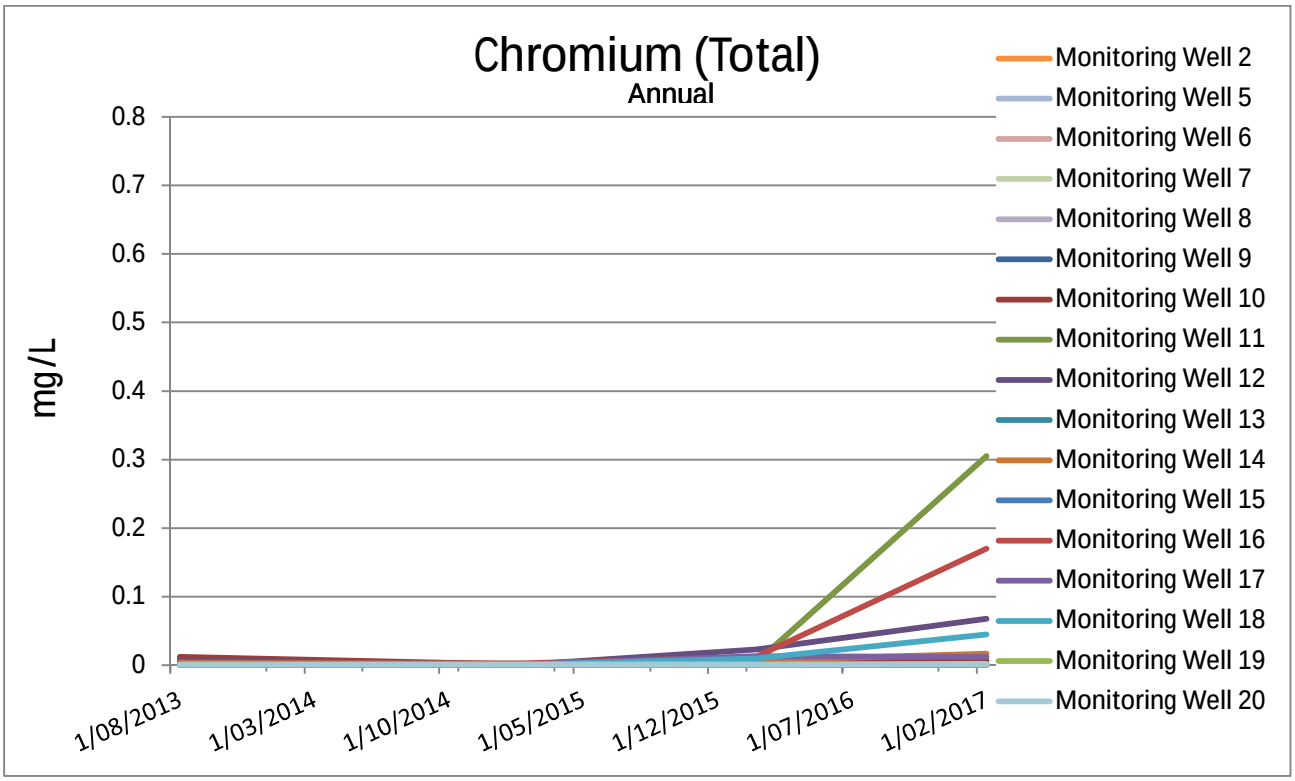
Benzene concentrations are non-existent at the Site. Every instance of benzene sampling has not yielded a result due to the concentration of benzene being below laboratory testing thresholds.

Figure 3.2.4.5 Cadmium results presentation



The US EPA sets the maximum contaminant level of cadmium in groundwater at 0.01mg/L. Cadmium levels present in the ground water monitoring wells are extremely low. Cadmium levels are always well below 0.01 mg/L and below detectable limits in the majority of readings taken during the reporting period.

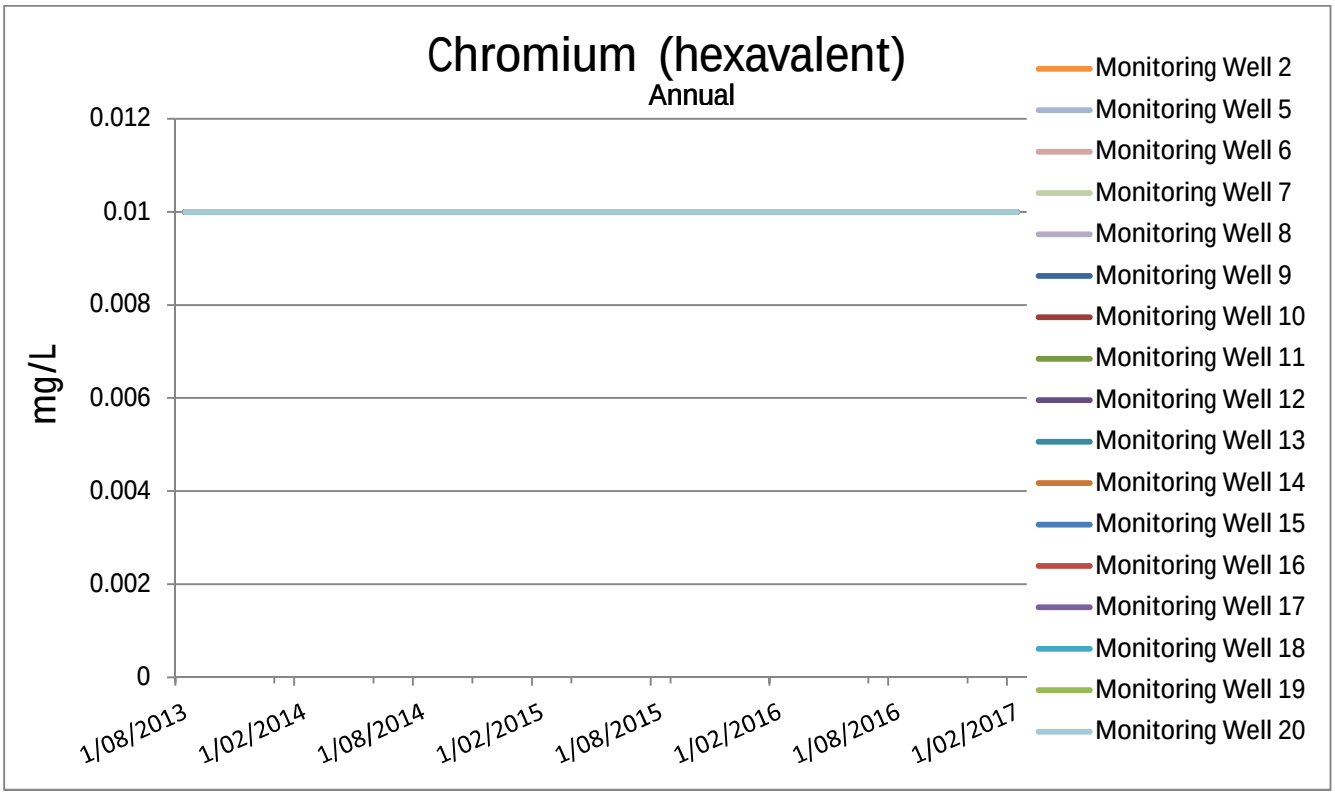
Figure 3.2.4.6 Chromium results presentation



The US EPA sets the maximum contaminant level of chromium in groundwater at 0.05mg/L The levels of chromium detected in the ground water monitoring wells over the reporting period have been extremely low.

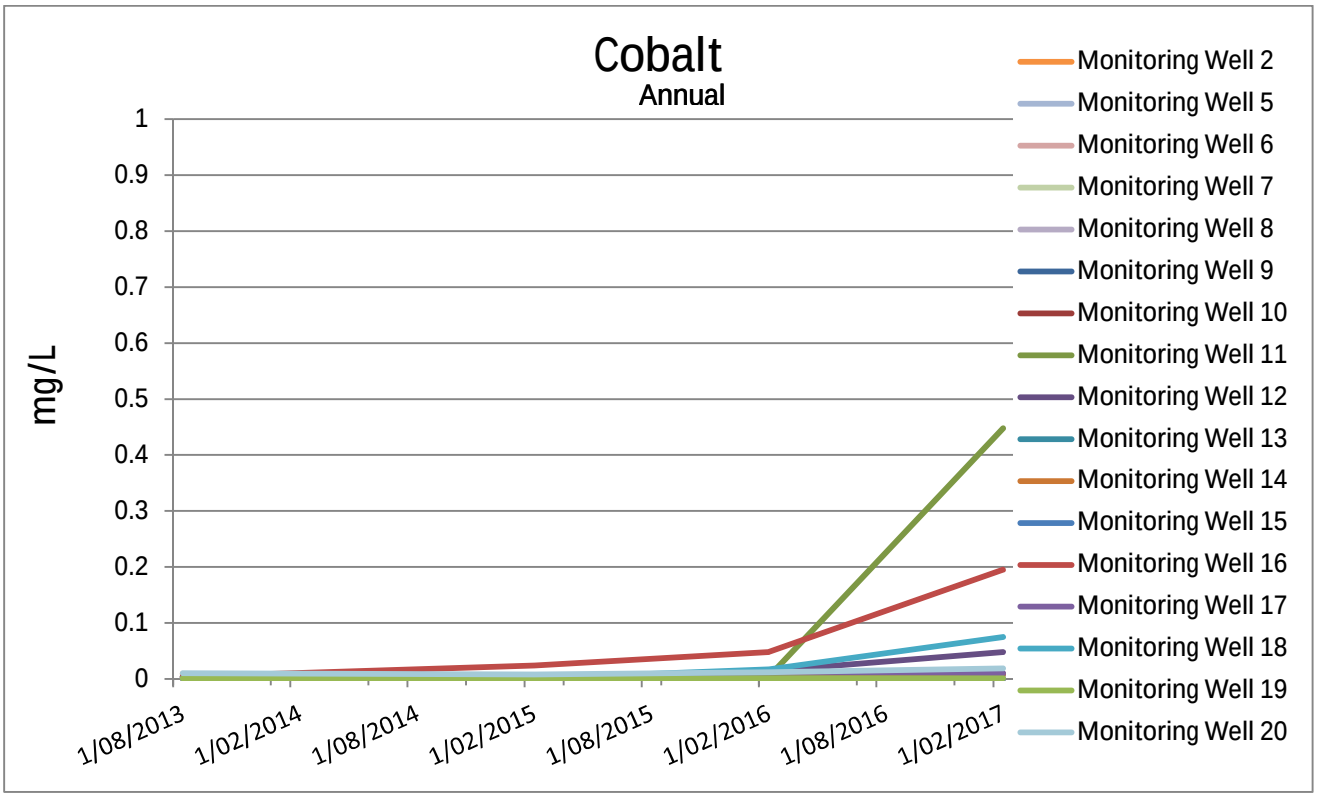
Monitoring point 11 is located in an up gradient location and representative of groundwater flow into the WWARRP from adjacent land used for cattle grazing, will be closely monitored in future sampling rounds.

Figure 3.2.4.7 Chromium (hexavalent) results presentation



Hexavalent chromium has not been detected in any samples taken for the Site. The demonstrated model shows that the concentration of hexavalent chromium results received is below laboratory testing thresholds.

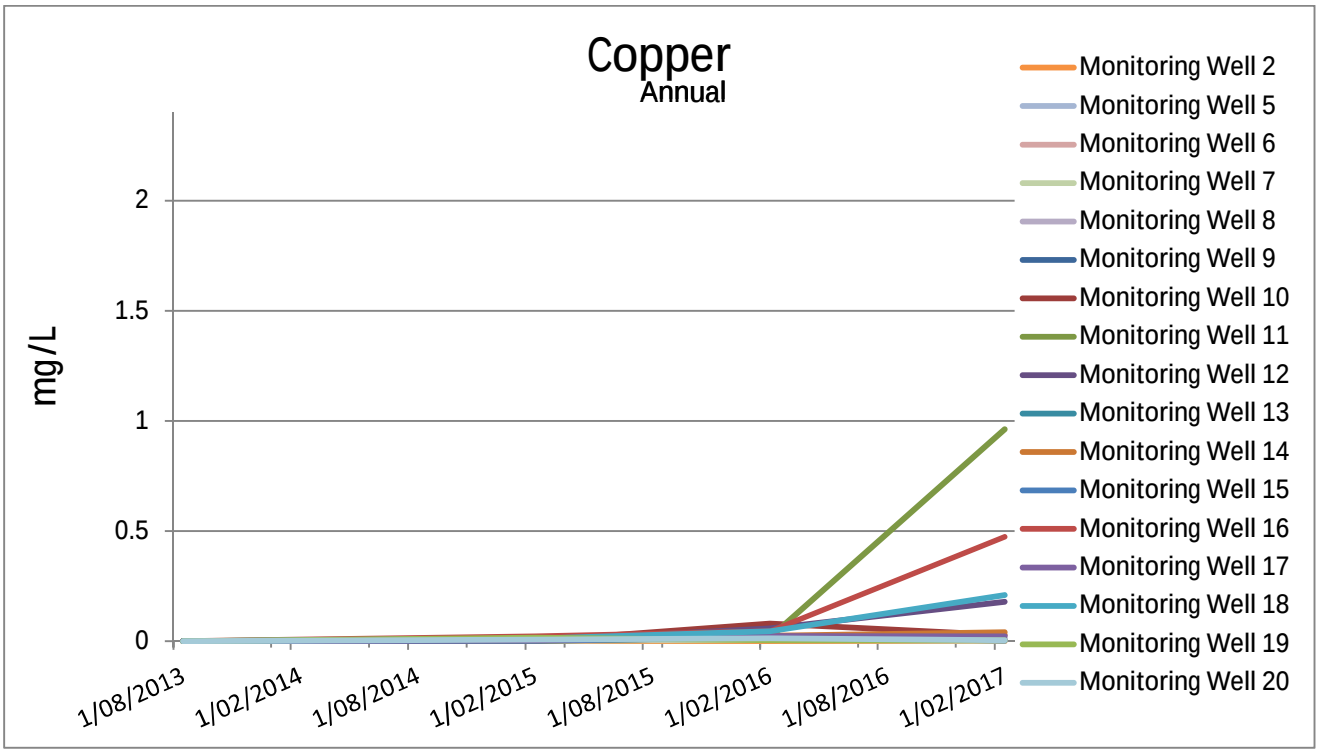
Figure 3.2.4.8 Cobalt results presentation



Anthropogenic sources of cobalt in the environment include agricultural runoff (trace amounts), sewage effluent, paints, inks and from electroplating in batteries. Worksafe Australia limits cobalt exposure to 0.05 mg/m^3 over 8 hours. The relatively higher level of cobalt in well 16, whilst still low, is noteworthy and should be re-reviewed during the next round of annual testing. Monitoring point 11 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing. Accumulation is not thought to be an issue due to cobalt's small half-life.

Monitoring point 11 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing. This monitoring point is to be closely monitored in future sampling events.

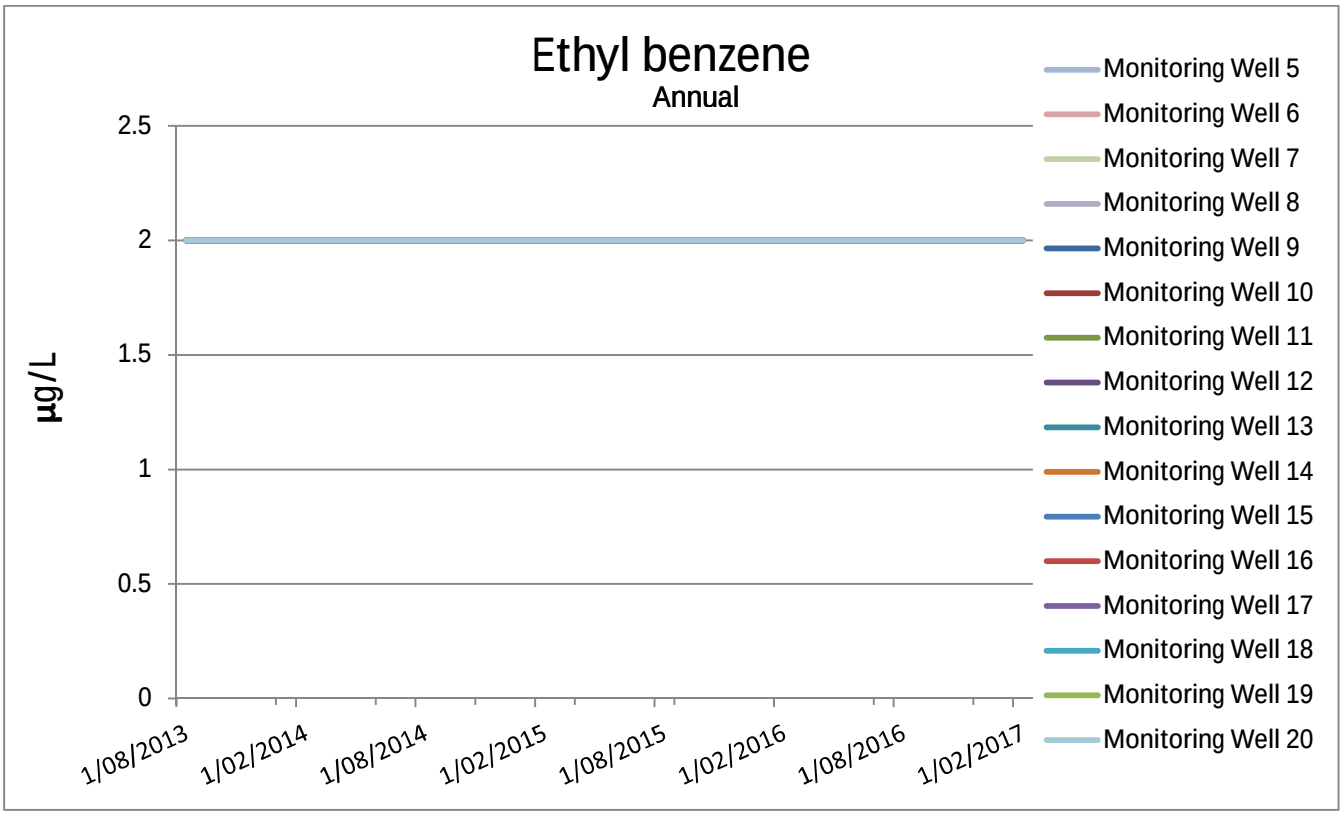
Figure 3.2.4.9 Copper results presentation



Tested results from the ground water monitoring wells show an extremely small amount of copper. The *2011 Australian Drinking Water Guidelines 6* prescribes an aesthetic limit of 1 mg/L of copper in drinking water. Clearly, the results therefore indicate that copper contamination is not evident or at extreme low levels.

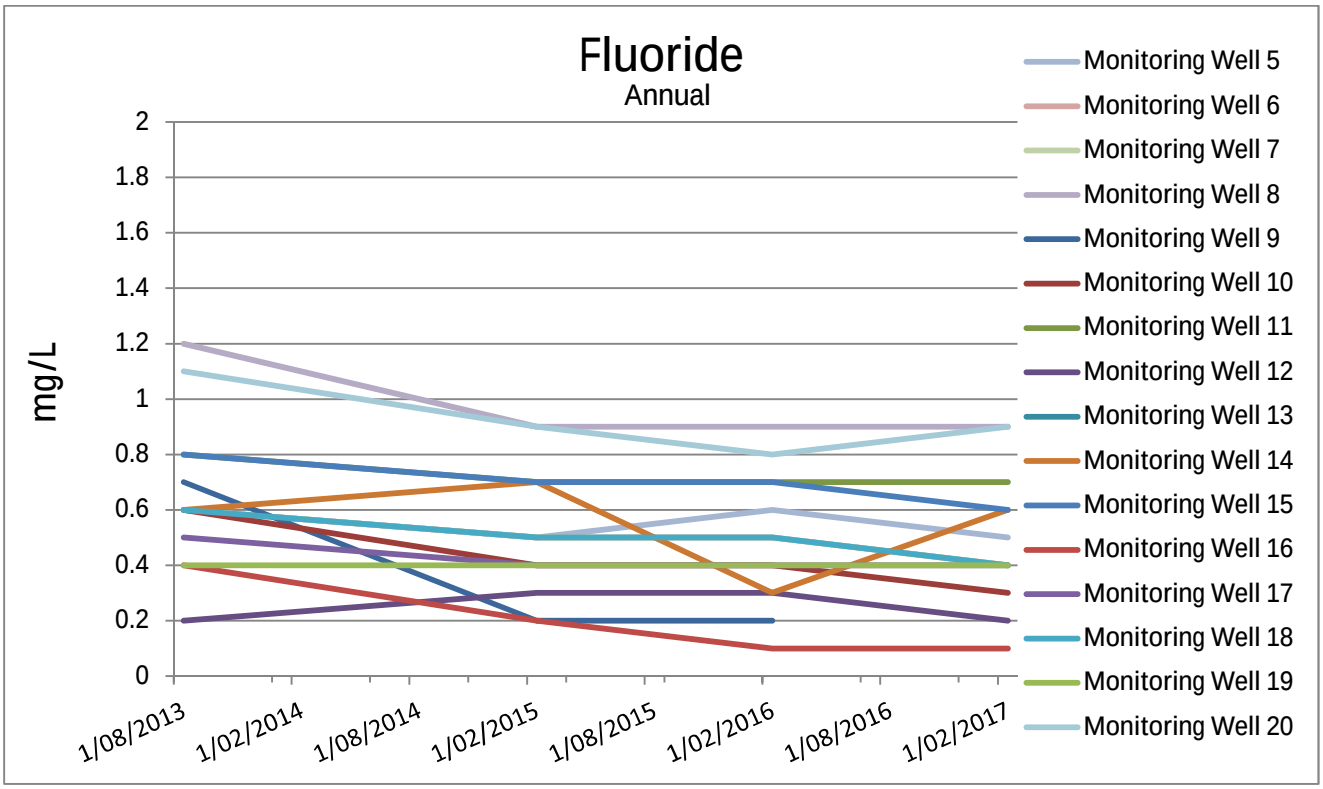
Monitoring wells located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing. Whilst the level appears relatively high, the actual concentration is still considered as very low.

Figure 3.2.4.10 Ethyl Benzene results presentation



Ethyl benzene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity above laboratory testing limits.

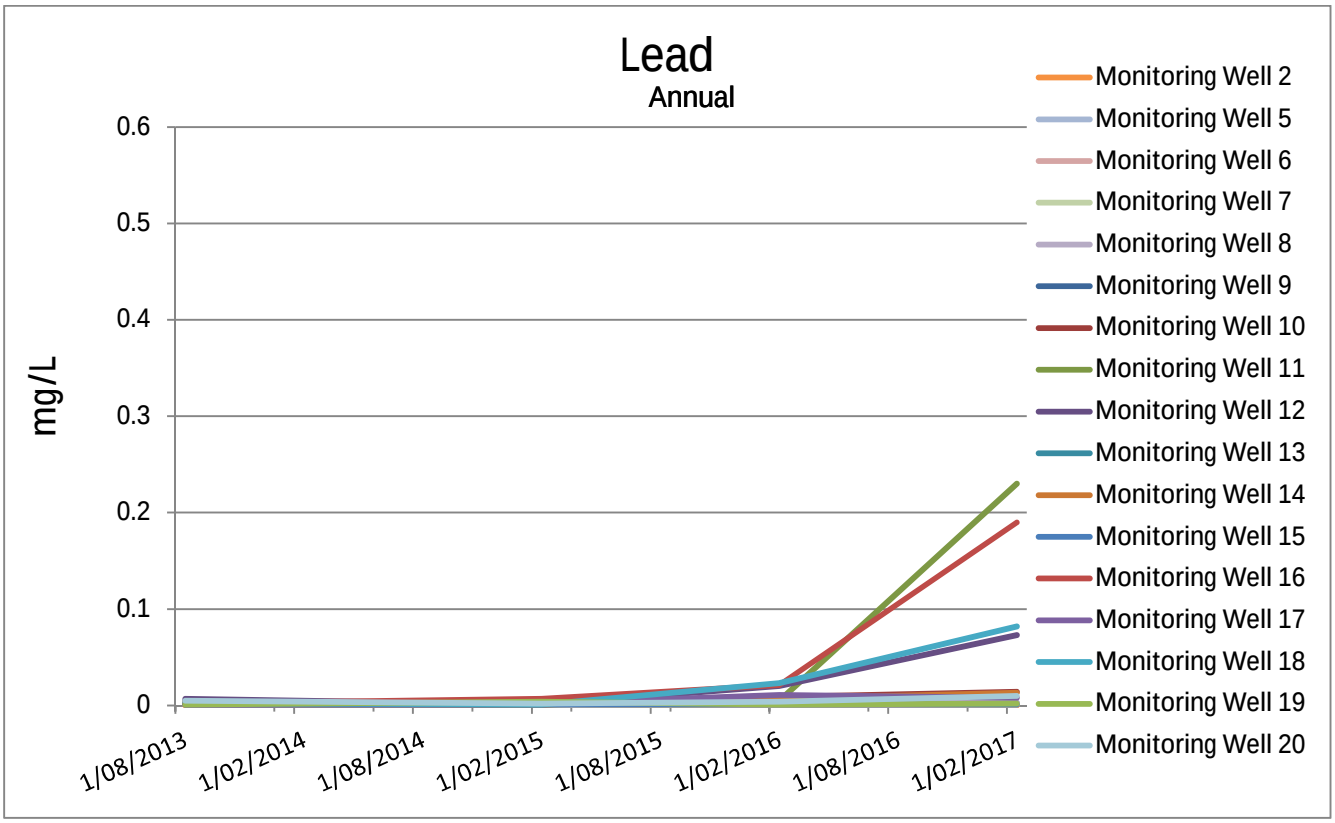
Figure 3.2.4.11 Fluoride results presentation



Industrial emissions are understood to be the primary anthropogenic pathway for fluoride to enter the environment. The US EPA sets the maximum contaminant level of fluoride in groundwater at 4 mg/L. Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L.

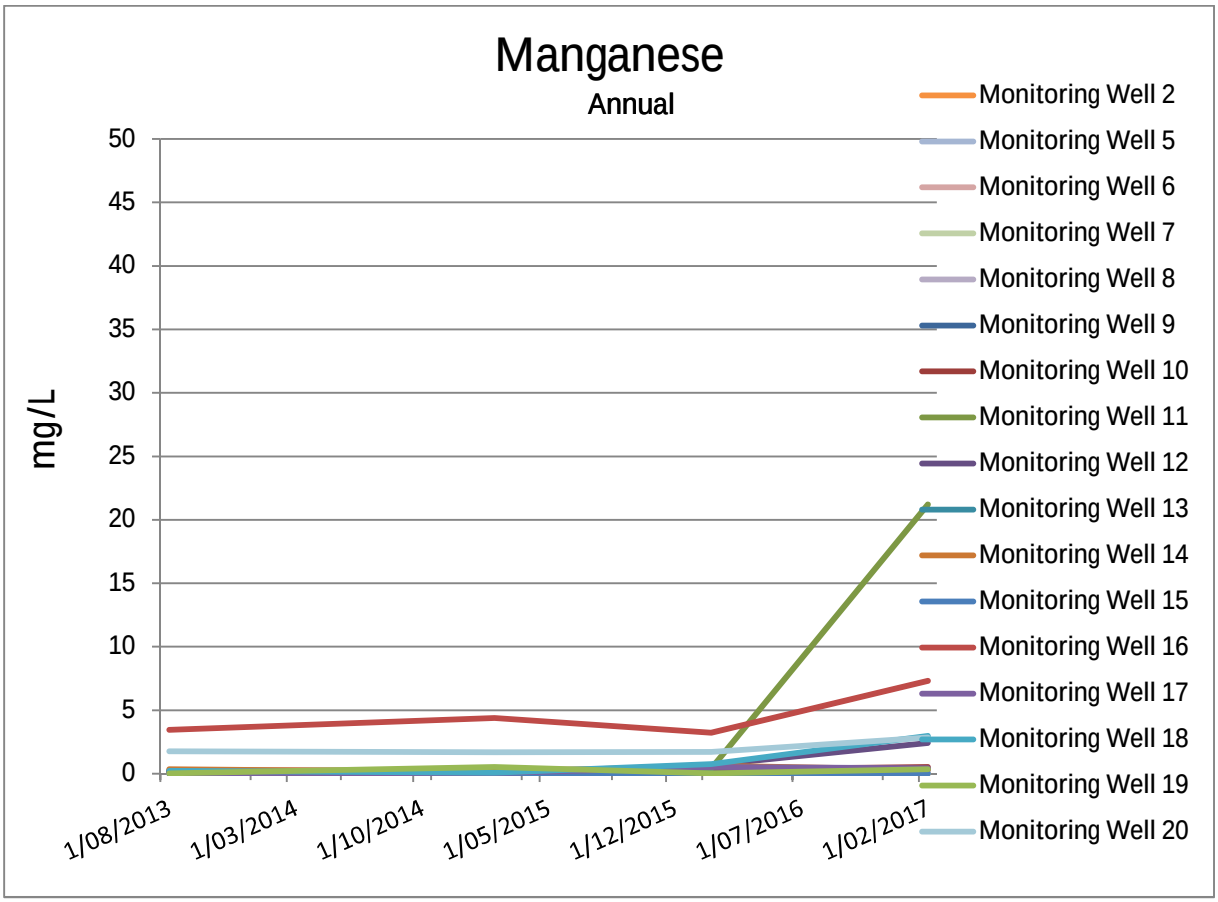
The fluoride concentrations found in the Sites groundwater are considered to be quite stable.

Figure 3.2.4.12 Lead results presentation



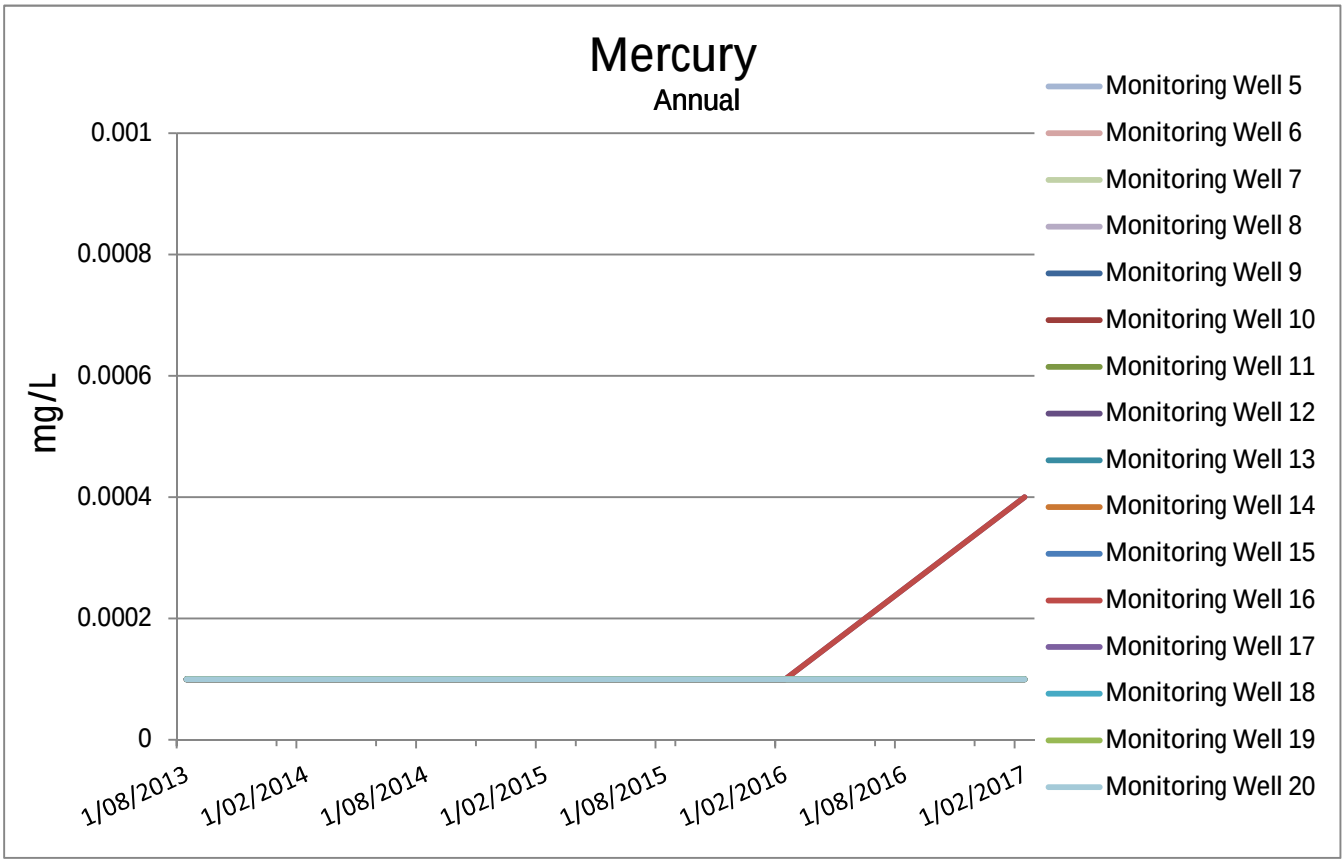
Heavy metal contamination in the groundwater in the form of lead is at very low levels. The presented data on the surface appears to indicate a steep climb of most locations during the reporting period. However, the results are extremely close to the testing limits achievable in a laboratory. For perspective, 95% of the samples taken indicate that lead levels are safe for human consumption.

Figure 3.2.4.13 Manganese results presentation



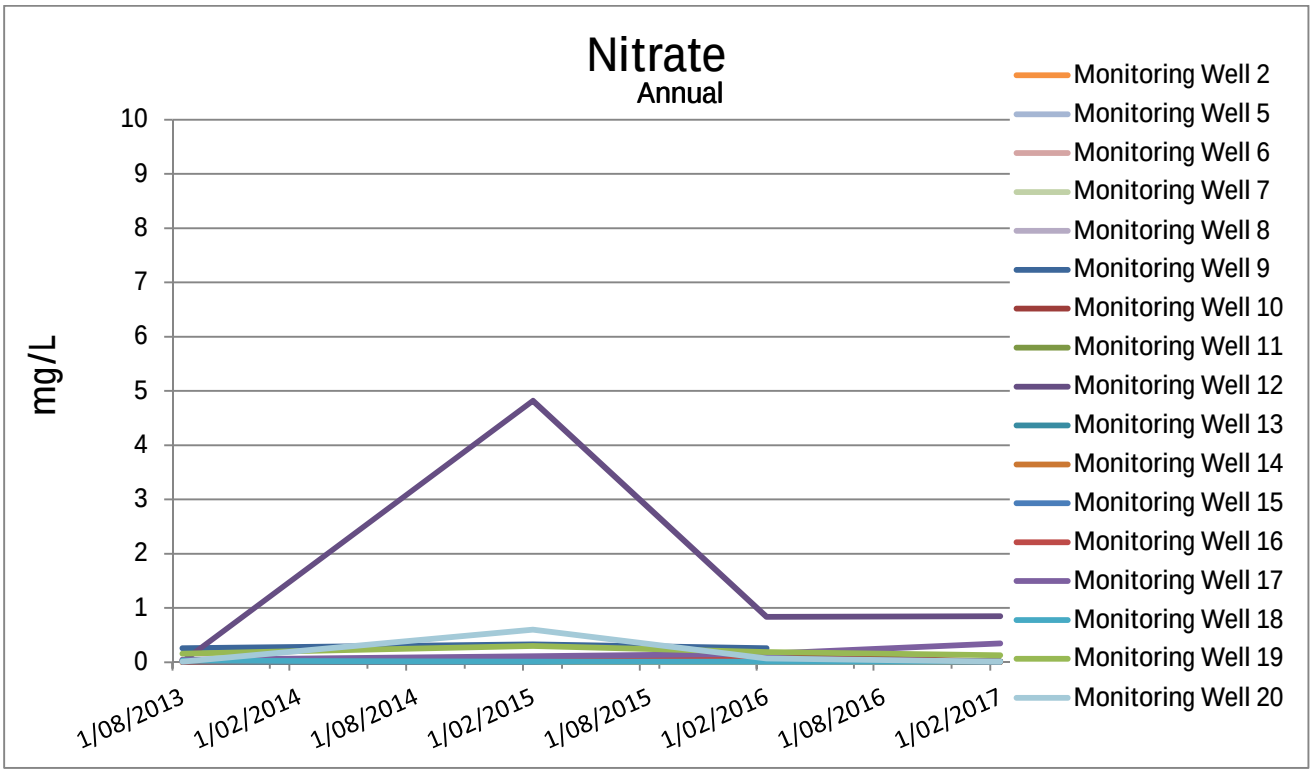
Manganese can be a strong indicator of landfill leachate in groundwater leached from hazardous waste sites and commonly derived from battery disposal. Monitoring point 11 has demonstrated relatively higher levels of manganese over the reporting period. This result is at odds with surrounding monitoring wells. Continued annual monitoring will help determine the stability of manganese concentration in these locations.

Figure 3.2.4.14 Mercury results presentation



Most results provide concentrations below the limit of laboratory testing for mercury. The exception is Well 16 which whilst still at low actual levels, should be monitored closely during the next round of testing.

Figure 3.2.4.15 Nitrate results presentation



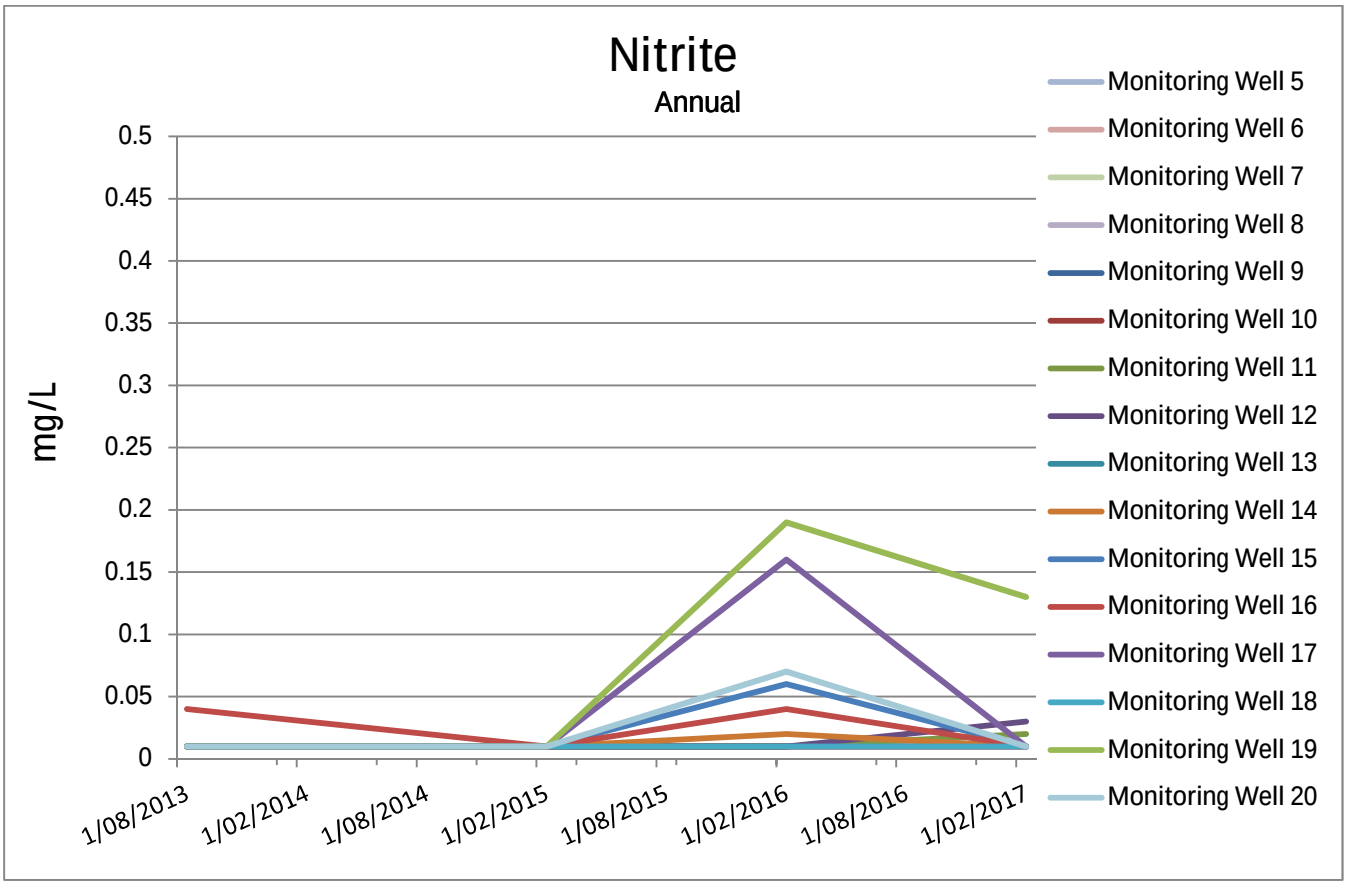
The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 50 mg/L of nitrate is safe for consumption.

Nitrate and nitrite are naturally occurring ions that are part of the nitrogen cycle that includes the decomposition of organic matter, such as what takes place in landfills. Denitrification is a process common in leachate treatment where the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form occurs. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen.

The World Health Organisation suggests that nitrate concentration in surface water is normally between up to 18 mg/L, therefore the levels found in the monitoring wells on Site are considered to be relatively low.

Monitoring wells 12 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing. The elevated 2015 result has more recently started to return to similar concentrations found in other monitoring wells.

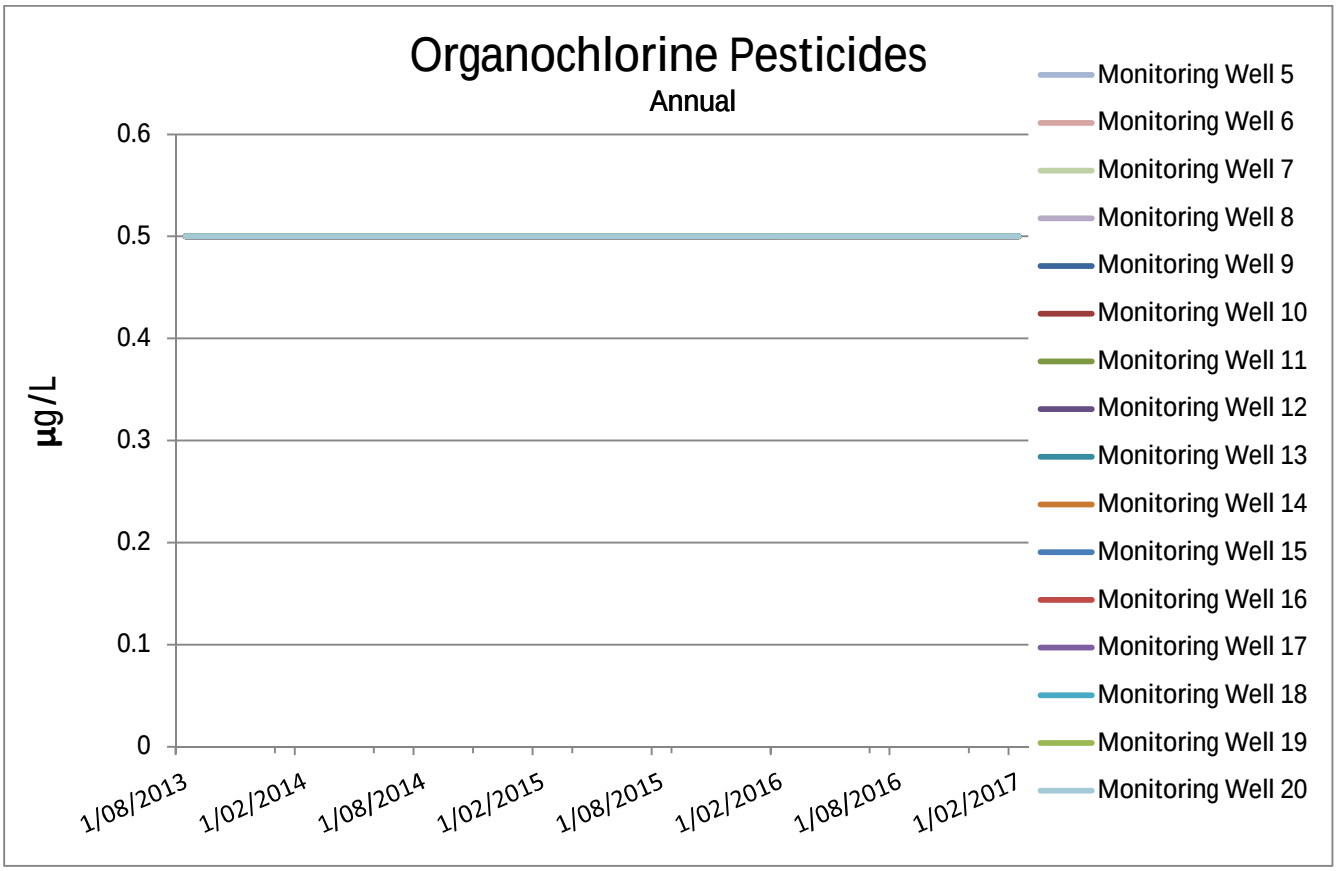
Figure 3.2.4.16 Nitrite results presentation



Nitrification is a twostep aerobic biological process where bacteria known as nitrosomonas convert ammonia and ammonium to nitrite. Next, bacteria called nitrobacter finish the conversion of nitrite to nitrate. The conversion of nitrite to nitrate is generally very fast and nitrite levels are therefore invariably quite low. More toxic than nitrate, nitrite is an indicator of ammonia (major constituent of landfill leachate) that has not been biologically processed (into nitrate). Nitrite levels above 3 mg/L are considered potentially harmful by the *2011 Australian Drinking Water Guidelines 6*.

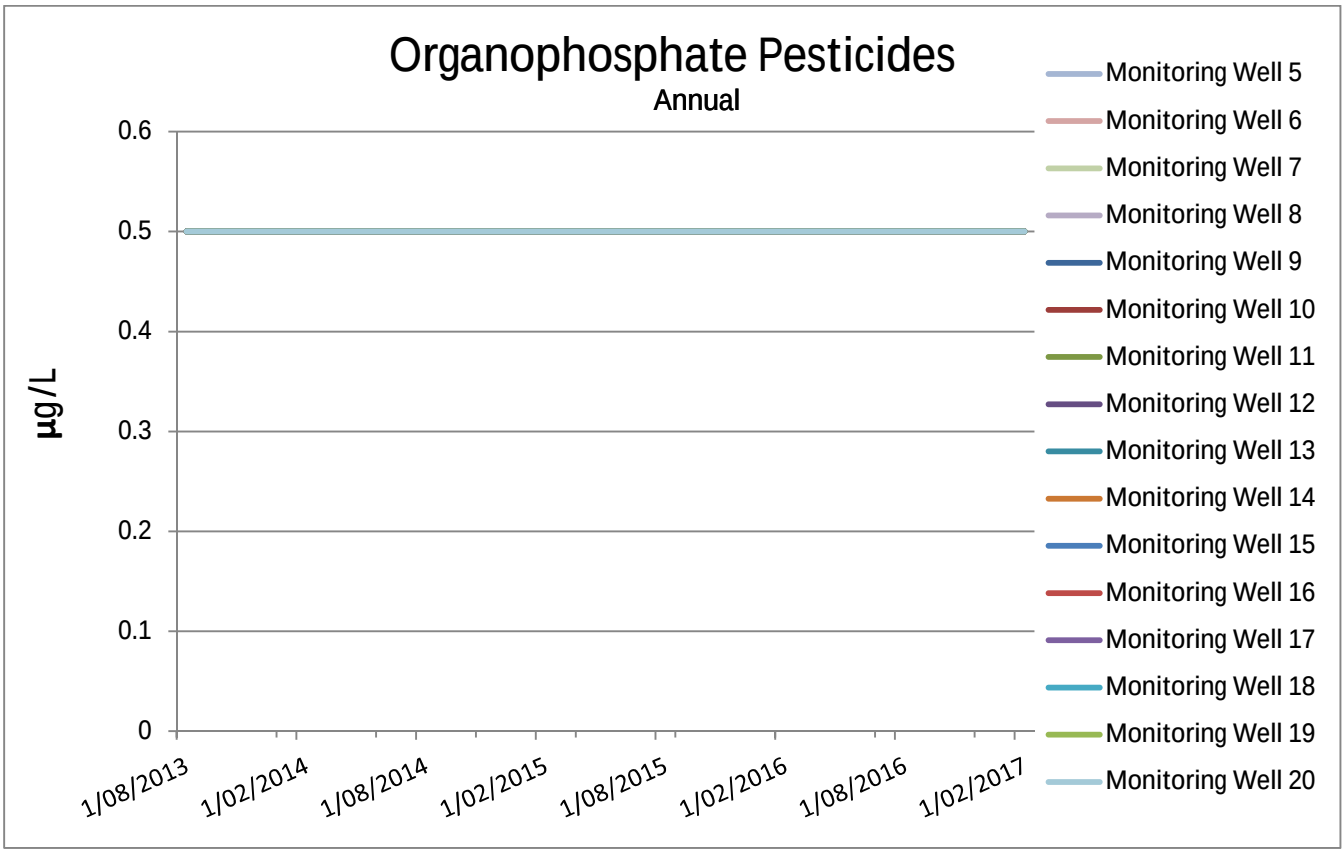
Nitrite levels found in the ground water monitoring wells are extremely small and below detectable limits in almost all of the samples taken. However, the slight increase in wells 17 and 19 in the previous reporting period have started to return to lower levels in the current reporting period.

Figure 3.2.4.17 Organochlorine Pesticides results presentation



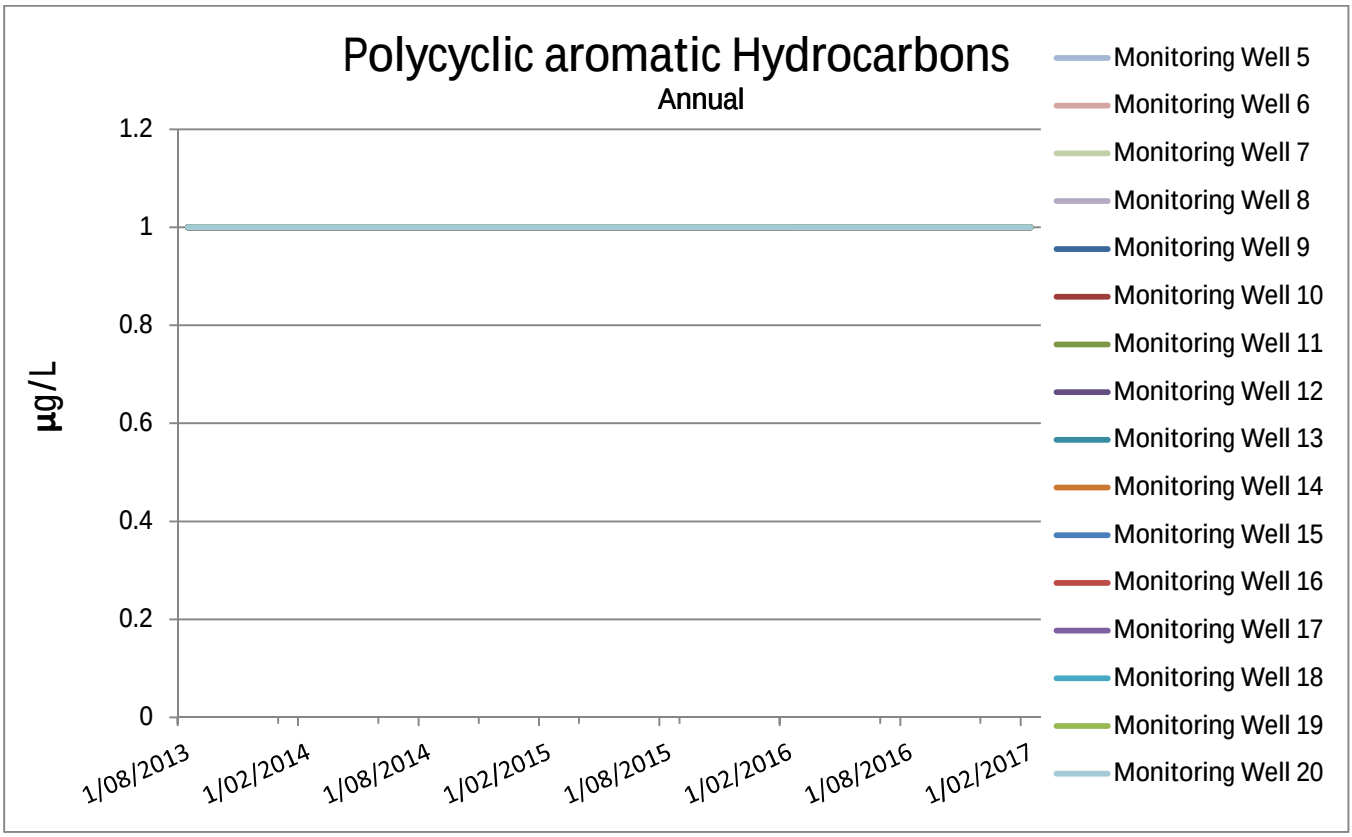
Organochlorine pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.18 Organophosphate Pesticides results presentation



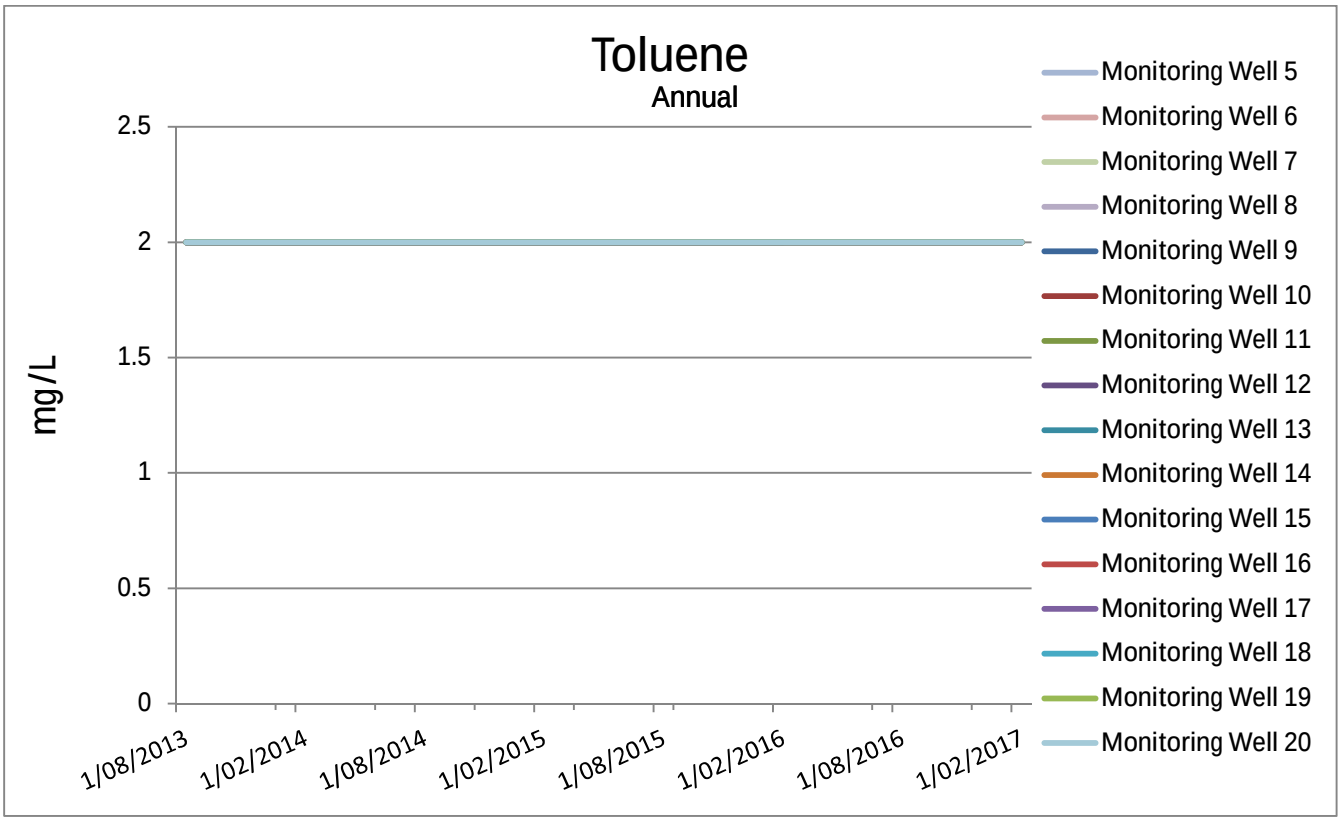
Organophosphate pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.19 Polycyclic Aromatic Hydrocarbons results presentation



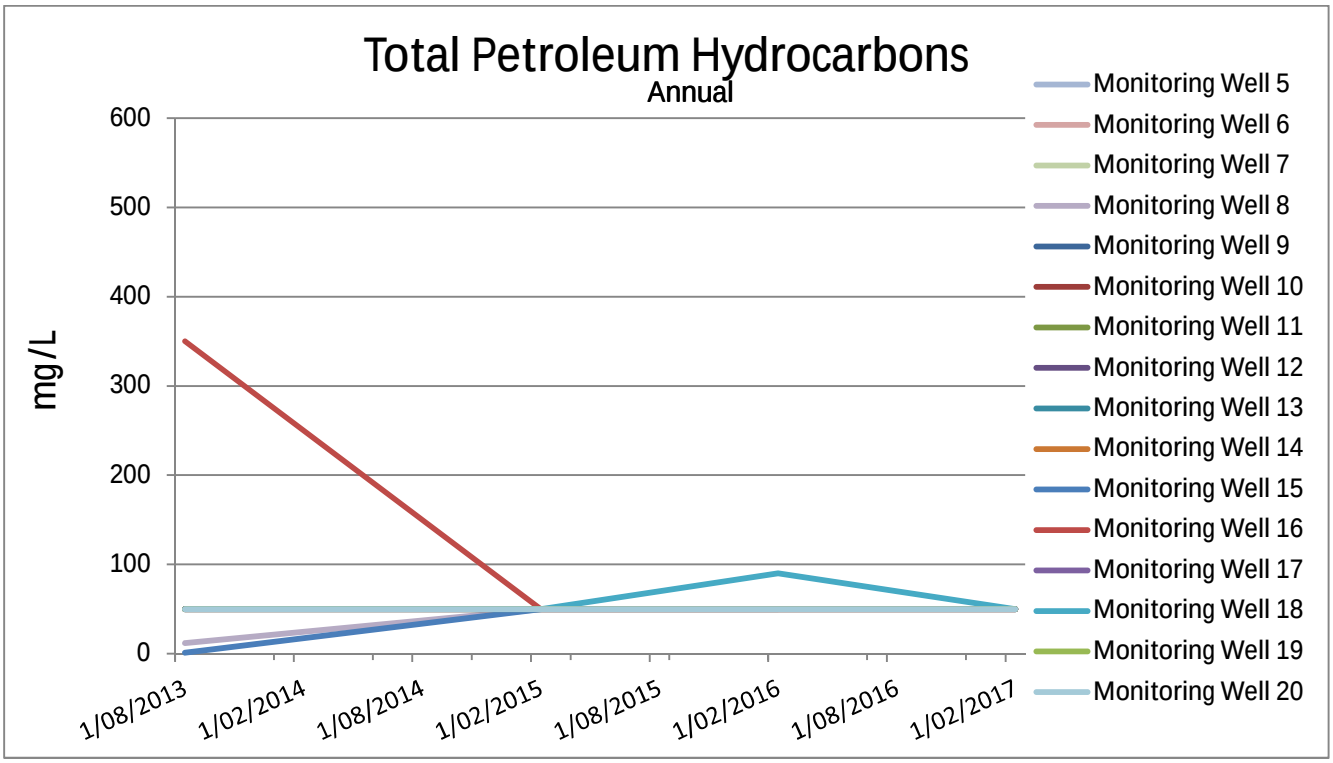
Polycyclic aromatic hydrocarbons were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.20 Toluene results presentation



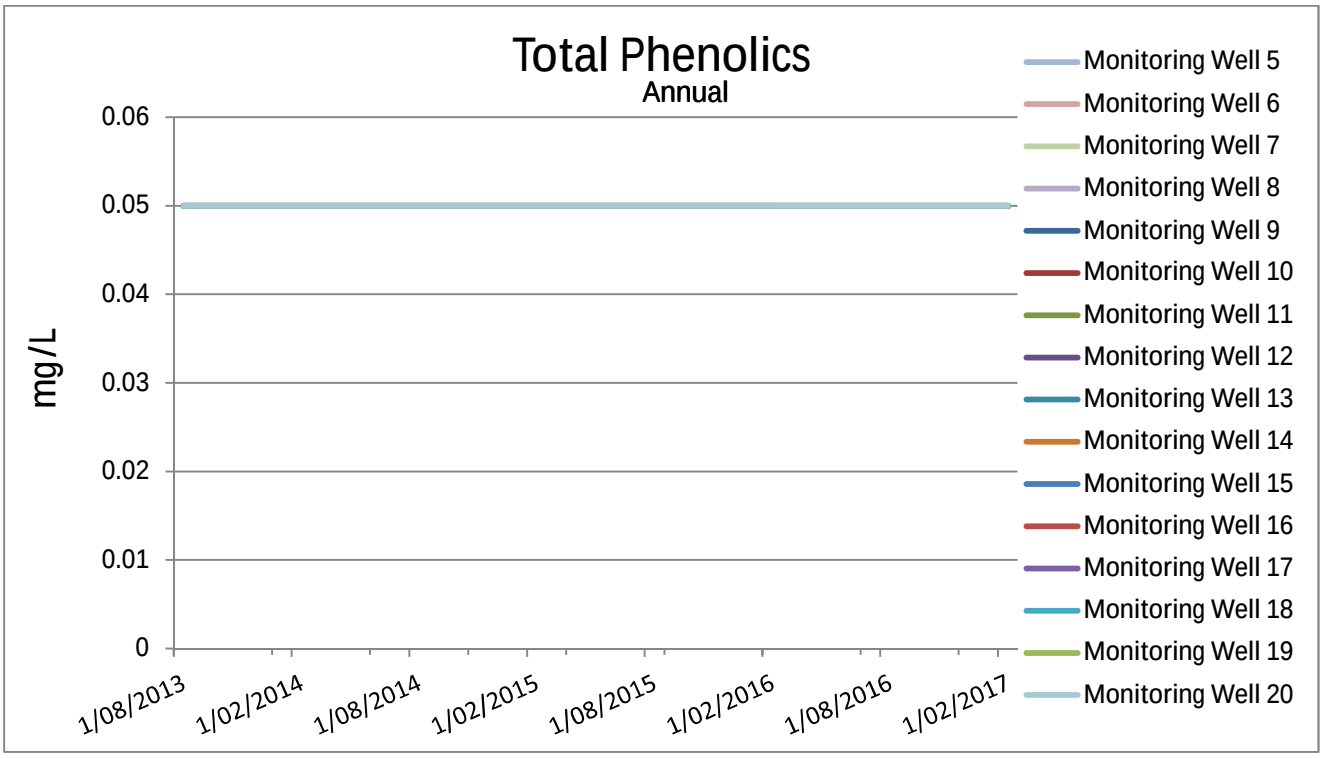
Toluene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.21 Total Petroleum Hydrocarbons results presentation



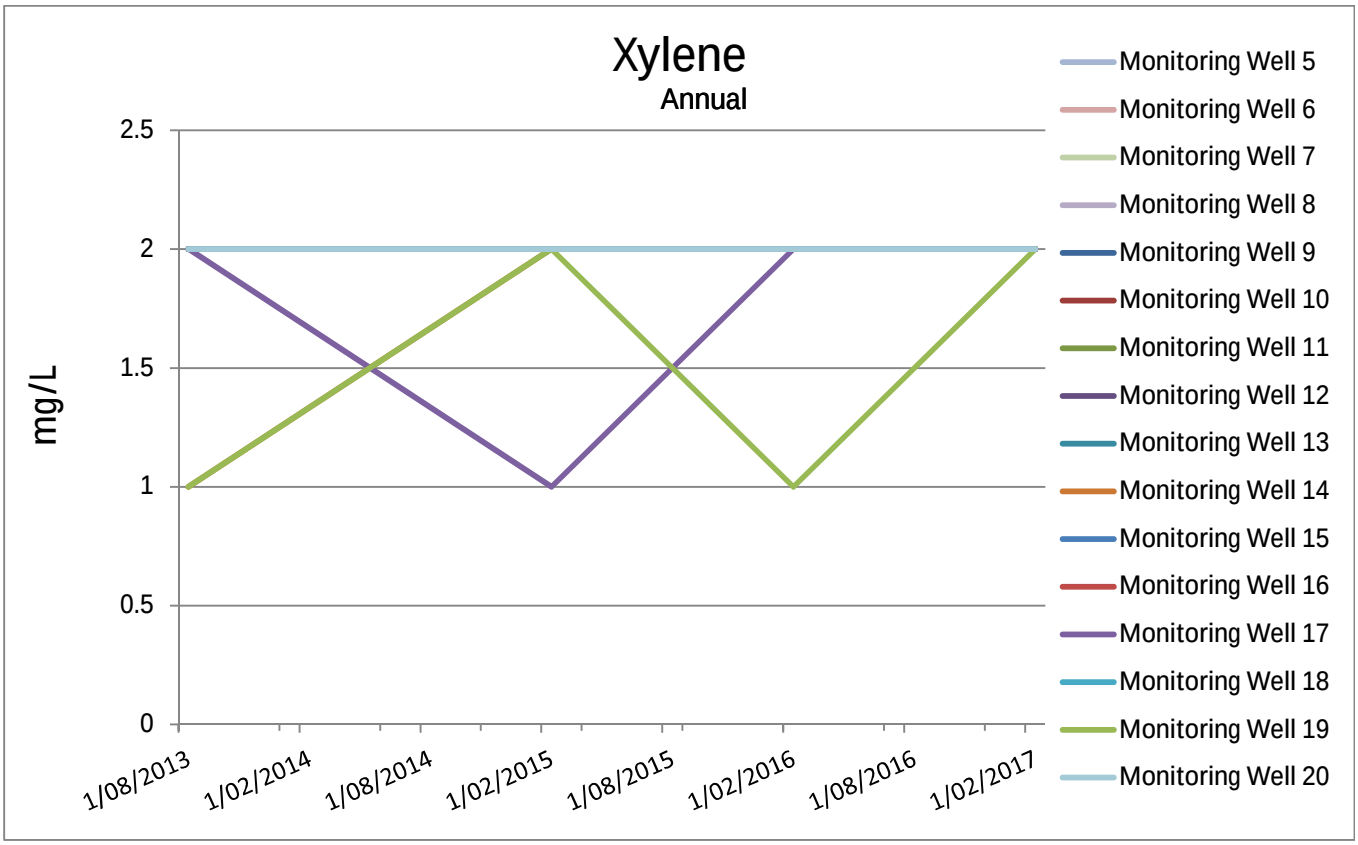
Total petroleum hydrocarbons are generally at concentrations below detectable limits in the monitoring wells. The initial spike in well 16 has since returned to low levels, whilst well 18 had exhibited a slight increase but has now returned to levels below detection limits. Continued annual monitoring will help identify any continued trends.

Figure 3.2.4.22 Total Phenolics results presentation



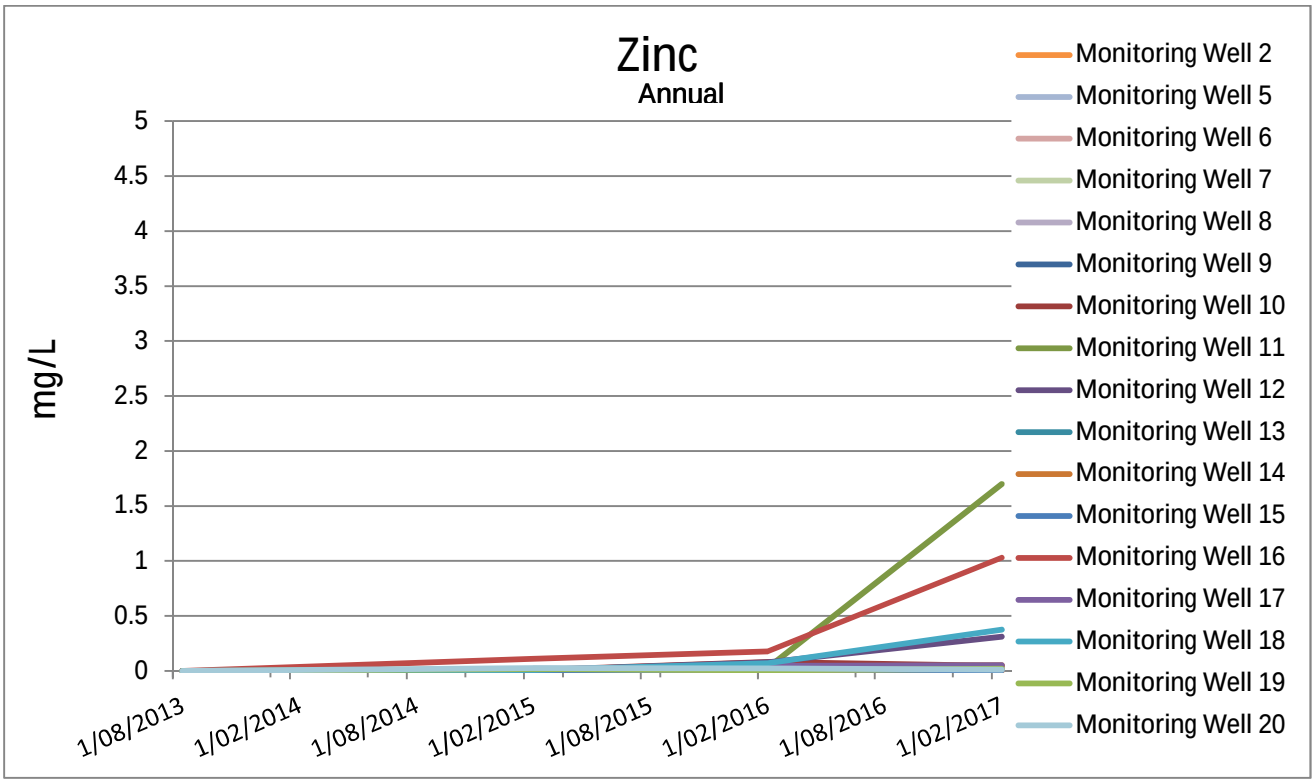
Total phenolics were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.23 Xylene results presentation



Xylene has not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories. Only the inconsistency in the applied laboratory standard (Note: laboratory is NATA accredited) between 1 mg/L and 2 mg/L as prescribed detectable limits has changed.

Figure 3.2.4.24 Zinc results presentation



The *2011 Australian Drinking Water Guidelines 6* states that for aesthetic reasons a maximum of 3 mg/L of zinc is desirable for consumption. Landfill sites can be an anthropogenic source of zinc in groundwater, however despite the extremely low levels of zinc detected; monitoring well 11 & 16 should be further monitored in future annual sampling regimes due to the display of levels higher than the other surrounding points.

3.2.5 Groundwater Testing Results Interpretation

Results indicate that there has been no conclusive and significant increase in concentration levels for any of the analytes detailed when compared to the historical results and trends. The following table indicates the analytes that should be closely monitored for developing trends at the next scheduled round of testing:

Table 3.2.5 Analytes that require closer scrutiny on future sampling

2016/2017

Analyte	Monitoring Point	Regime	Next Sample
Nitrogen (Ammonia)	16	Quarterly	August 2017
Aluminium	12,16,18	Annual	February 2018
Barium	16	Annual	February 2018
Cadmium	11,16	Annual	February 2018
Chromium (total)	11,16	Annual	February 2018
Cobalt	11,16	Annual	February 2018
Copper	11,16	Annual	February 2018
Lead	16, 18	Annual	February 2018
Manganese	11,16	Annual	February 2018
Zinc	11,16	Annual	February 2018

Key indicators of landfill leachate's potential ingress into groundwater particularly ammonia, nitrate, nitrite levels and other less poignant indicators as tested do not conclude that that landfill leachate is entering the surrounding ground water system. However, the results presenting in monitoring wells 11 and 16 in particular warrant continued scrutiny.

Therefore, monitoring for a select group of samples will be quadrupled for the new reporting period. See 4.1.2 for more details.

3.3 AIR EMISSIONS MONITORING

3.3.1 Tabulated Results

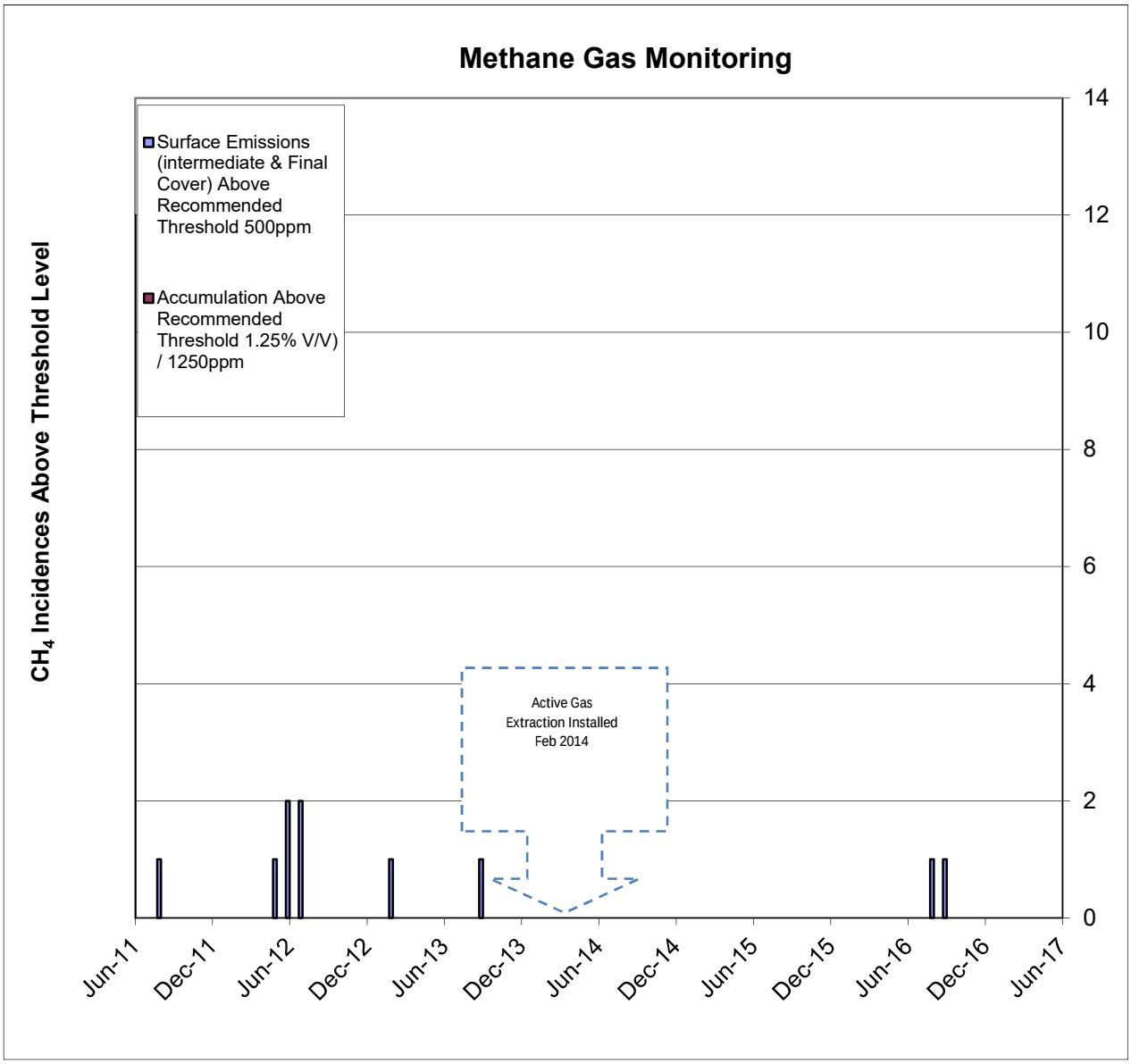
Table 3.3.1 Methane monitoring results for the reporting period

Date	Results Above Recommended Threshold 500ppm	Accumulation Above Recommended Threshold 1250ppm
Jun-16	0	0
Jul-16	0	0
Aug-16	1	0
Sep-16	1	0
Oct-16	0	0
Nov-16	0	0
Dec-16	0	0
Jan-17	0	0
Feb-17	0	0
Mar-17	0	0
Apr-17	0	0
May-17	0	0

The presented data describes the number of individual sample results derived from monthly testing that are above the EPA Benchmark Technique recommended threshold levels for further action regarding surface emissions (500 ppm) and accumulation levels (1,250 ppm).

3.3.2 Data Presentation

Figure 3.3.2 Air emissions test results above benchmark recommended threshold levels presentation



The surface emissions sampled in August 2016 (located at the edge of the liner) and September 2017 (located at the southern edge of the cell) were recorded above acceptable limits, however upon further investigation it is noted the surrounding grid pattern (25 meter spacing's) did not register elevated levels. Both areas were monitored and further samples taken have been low and in line with historical trends.

3.3.3 Air Emissions Monitoring Results Interpretation

During the period 2011-2012 results sampled by GHD showed continued occurrences of surface methane emissions above the EPA recommended threshold levels. A more recent contract awarded to a NATA approved laboratory (ALS Environmental) has shown that the GHD recorded levels were potentially overstated. Both companies state that the accumulation monitoring clearly shows that the methane is not migrating offsite.

Despite the differences in sample results, the site has the potential to generate relatively high amounts of landfill gas, namely methane that must be dealt with. Accordingly, Council commenced installation of methane gas extraction infrastructure in February 2014. Phase 1 (covering the older western gully) of the landfill gas management is in place and connected to a flaring unit. Phase 2 (capturing gas from legacy waste in under the new cell liner in eastern gully) has been fully constructed and has been commissioned. The final Phase 3 gas collection system will include infrastructure within the waste filling of the new landfill cell at the WWARRP.

3.4 ENVIRONMENTAL COMPLAINTS

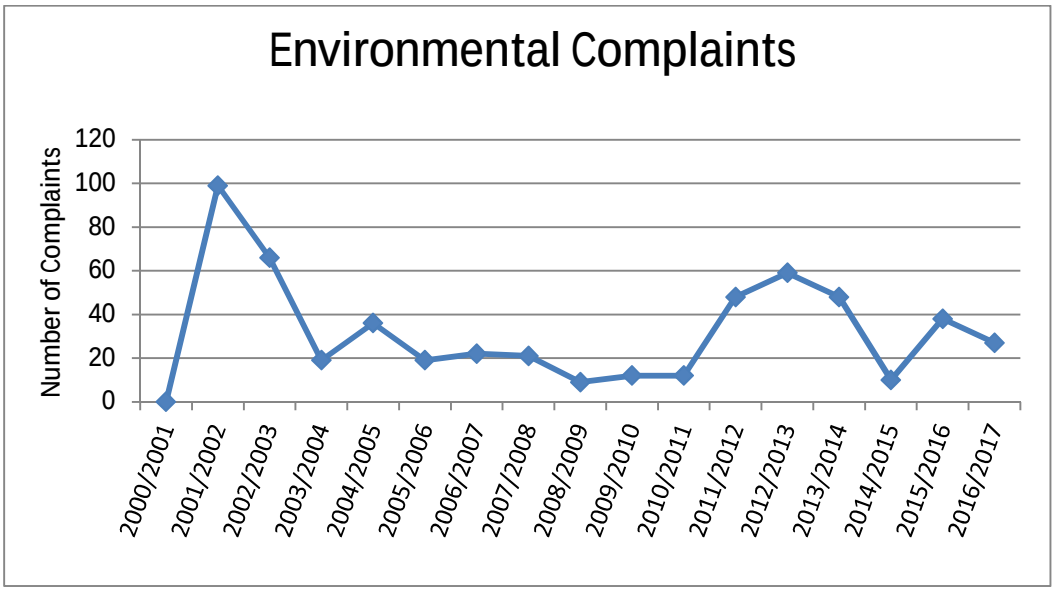
3.4.1 Tabulated Results

Table 3.4.1.1 Environmental complaints

Year	Environmental Complaints
2000/2001	0
2001/2002	99
2002/2003	66
2003/2004	19
2004/2005	36
2005/2006	19
2006/2007	22
2007/2008	21
2008/2009	9
2009/2010	12
2010/2011	12
2011/2012	48
2012/2013	59
2013/2014	48
2014/2015	10
2015/2016	38
2016/2017	27

3.4.2 Data Presentation

Figure 3.4.2.1 Environmental related complaints presentation



3.4.3 Environmental Complaints Results Interpretation

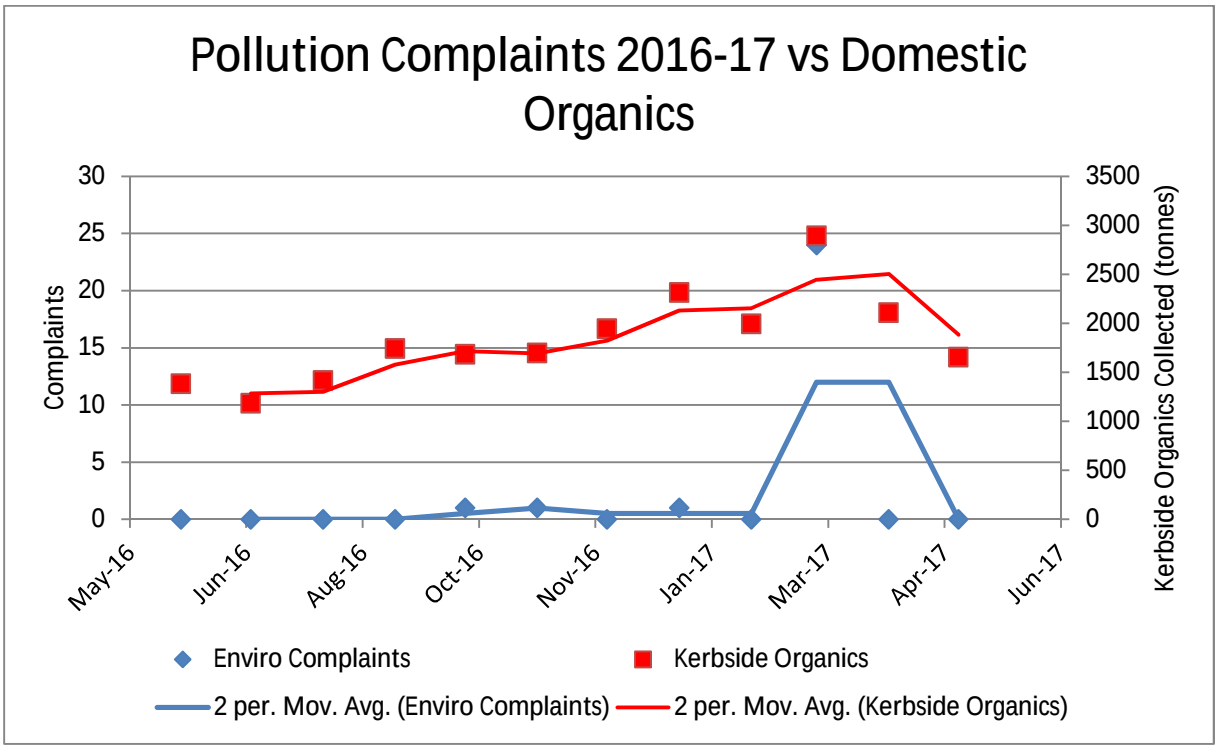
The overlying trend for environmental complaints had been downward after closure of the solid waste energy recovery facility in 2004. However, the reporting periods 2011/12 to 2013/14 have given rise to a spike of approximately 150 complaints, invariably regarding perceived odour from the WWARRP. It should be noted that Council commenced community engagement over a new landfill cell development at Whytes Gully coinciding with the 2011/12 year complaints spike.

From 01 July 2014, kerbside green waste not stored at the WWARRP, instead it is unloaded at a nearby site on Reddalls Road. Organics received at the WWARRP are removed from site and processed at the above mentioned nearby facility.

All air pollution complaints received were investigated. Evidence was gathered and data from the on-site weather station was invaluable comparing the source of the odour and prevailing wind direction relative to the Wollongong Waste and Resource Recovery site (Whytes Gully)

The bulk of the complaints (almost 85%) conveyed in the reporting period have been received in March 2017. The majority of the pollution complaints received coincided with the timing of the proposed expansion of the nearby organics processing facility and the associated notification and advertising to key stakeholders and neighbours.

Figure 3.4.3.1 Pollution (odour) complaints compared to garden organics collection volumes



As demonstrated by the blue line in the Figure 3.4.3.1, the majority of complaints have been received during late summer and into the autumn season. This mirrors the red line which displays trend average volume of green waste collected from kerbside collections (Wollongong only). Statistically, the data set for odour related complaints has a strong correlation value (r^2) of greater than +0.5 to the data set for the volume of domestic garden organics. This gives efficacy to the theory that garden organics are most often the source of odours detected by nearby residents.

From 01 July 2014, kerbside green waste not stored at the WWARRP, instead it is unloaded at a nearby site on Reddalls Road, which also accepts other Council area's green waste and food waste. Regardless of this, Wollongong City Council fully investigates all odour complaints received upon receipt of the complaint.

3.5 TRADE WASTEWATER RESULTS

As required in Clause M6.2 of the Sites EPL, the Trade Wastewater Results are tabulated below:

Table 3.5.1 Trade Wastewater Results Jun-Aug 2016

Analyte	Units	2-Jun	15 Jun	21 Jun	13 July	5 Aug	25 Aug
pH Start	Units	9.7	7.1	7.5	7.8	7.7	7.5
TDS	mg/L	6020	2370	2420	2680	3040	3350
TSS	mg/L	41	59	24	42	106	109
Ammonia (N)	mg/L	22.5	18.7	28	93.9	<0.1	<0.1
pH Finish	Units	9.1	7.4	7.5	8.4	7	7
BOD	mg/L	35	62	38	99	15	35
Temp	^{o}C	17	20	16	18	17	16

Table 3.5.2 Trade Wastewater Results Sep-Nov 2016

Analyte	Units	21-Sep	20-Oct	4-Nov	28-Nov
pH Start	Units	6.9	7.2	7.1	7.3
TDS	mg/L	3580	5630	4540	4880
TSS	mg/L	62	46	32	29
Ammonia (N)	mg/L	1	2	0.8	0.8
pH Finish	Units	6.8	7.1	7.1	8.4
BOD	mg/L	15	15	11	13
Temp	^{o}C	22	19	23	28

Table 3.5.3 Trade Wastewater Results Dec 16 –Feb 17

Analyte	Units	20-Dec	12-Jan	30-Jan	23-Feb
pH Start	Units	7.5	7.1	7.8	7.3
TDS	mg/L	5650	147	5630	4670
TSS	mg/L	50	30	70	29
Ammonia (N)	mg/L	203	<0.1	3.6	<0.1
pH Finish	Units	7.7	7.3	8.9	8
BOD	mg/L	38	10	6	6
Temp	^{o}C	22	34	30	21

Table 3.5.4 Trade Wastewater Results Mar – May 2017

Analyte	Units	16-Mar	6-Apr	28-Apr	16-May
pH Start	Units	7.4	6.8	8.6	7.6
TDS	mg/L	3290	2610	3510	3440
TSS	mg/L	22	24	8	31
Ammonia (N)	mg/L	<0.1	0.8	54.3	9.7
pH Finish	Units	7.4	6.7	7.6	7.8
BOD	mg/L	6	20	73	48
Temp	^{o}C	25	21	19	14

4 SITE SUMMATION

4.1 DEFICIENCY IDENTIFICATION & REMEDIATION

4.1.1 Surface Water Overflow Result of 78 mg/L in June 2016 and 88 mg/L in July 2016

Surface water that exited the site in June 2016 and July 2016 contained suspended solids at levels above the 50mg/L concentration limit prescribed in the sites Environment Protection Licence. Downstream samples taken at the same time indicate suspended solids <50mg/L concentration limit and it was affirmed that there was no material harm caused by the non-compliance (as defined by Section 147 of the POEO Act 1997).

To help reduce the likelihood of future non compliances, a Wet Weather and Stormwater Management work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. The Wet Weather and Stormwater Management work instruction is attached to this report in Annexure C.

Since the implementation of the new work instruction, no further sediment rich discharges have occurred.

Note: The stormwater ponds are regularly inspected and sampled to monitor compliance with EPL 5862. When Turbidity and pH levels are compliant a controlled release is approved. Re sampling is conducted at least once every 24 hours while controlled release is in progress. Inspection and sample data is recorded. The controlled release allows the sediment pond capacity to be maintained and increase storage capacity of stormwater on site during rain events. If an uncontrolled overflow event occurs, it is to be sampled and documented.

4.1.2 Ground water monitoring

Results presenting in monitoring wells 11 and 16 warrant continued scrutiny. An increase to current test schedule from annual to quarterly sampling will commence in August 2017 for Aluminium, Barium, Cadmium, Chromium (total,) Cobalt, Copper, Lead, Manganese and Zinc.

4.2 CONCLUSION

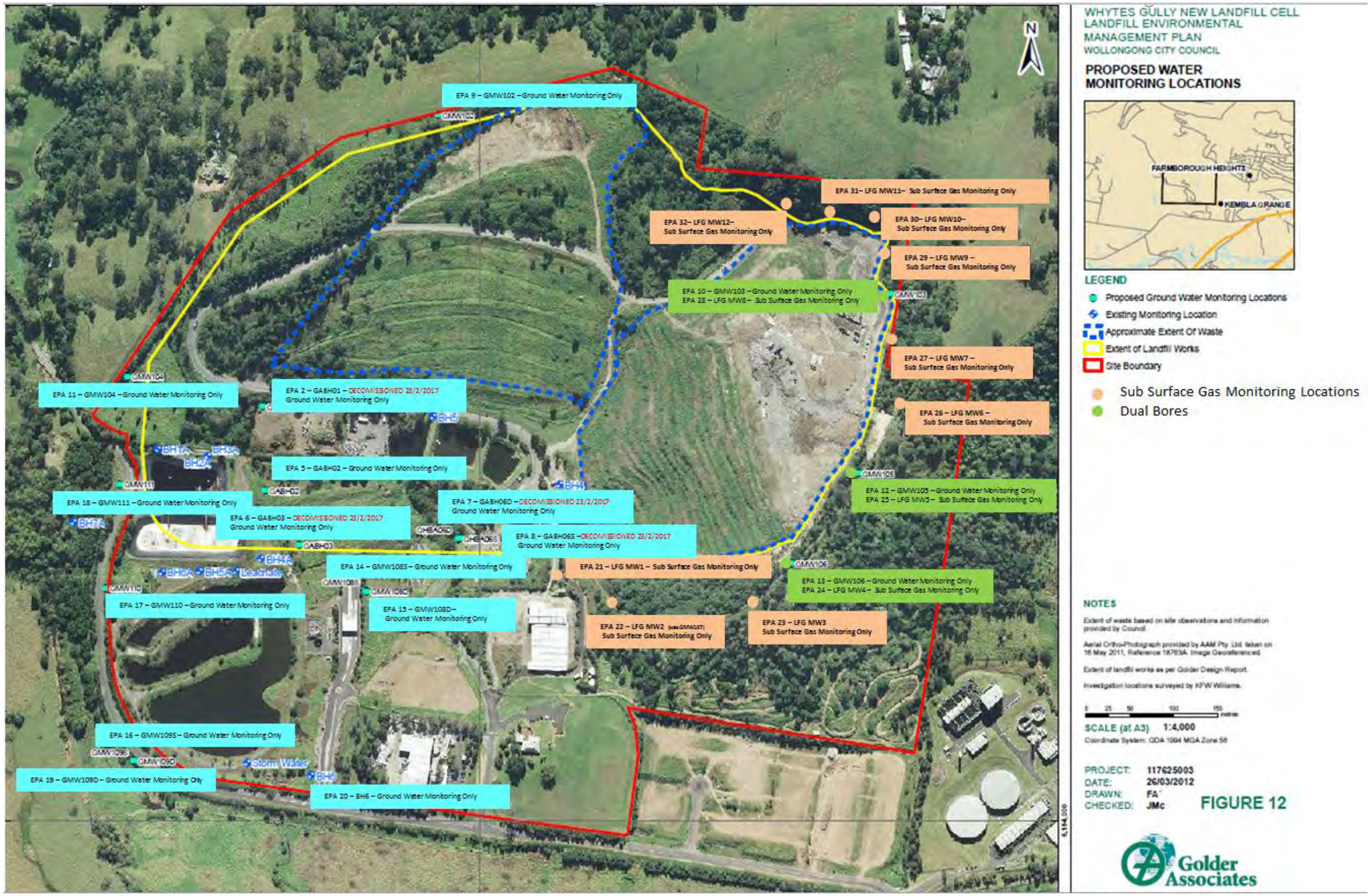
The site is performing well within the individual criteria and limits assigned to it in regard to environmental performance. The low number of deficiencies shows that Council has maintained satisfactory environmental performance. Actions are in place to monitor and improve the sites performance in regard to the identified deficiency in Section 4.1 which will ensure Council's goal of continuous environmental improvement at Whytes Gully is achieved.

Further, the modernised test regimes already implemented, along with the best practice multi redundancy lined new cell development will provide a far more sustainable environmental outcome for the surrounding environment and our community. Observations made in this year's annual return indicate that the new landfill cell development is functioning well and as designed.

Environmental Monitoring Locations

Wollongong Waste & Resource Recovery Park– 5862

Environmental Monitoring Points - Groundwater & Landfill Gas



ANNEXURE B

Example Environmental Incident Report

ENVIRONMENTAL INCIDENT REPORT - (1)

wollongong
city of innovation

Complete this form for all environmental incidents that occur at or on Wollongong City Council worksites.
MATERIAL HARM INCIDENTS MUST BE REPORTED TO 5 ESSENTIAL AGENCIES IMMEDIATELY

(i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
(ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and
(iii) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment

The purpose of this form (1) is to alert Waste Service to potential environmental incidents. It does not represent Wollongong City Council's final position for any incident reported on this form.

Remember!	Complete all fields prior to submitting form Be succinct, stick to the facts and **do not** make assumptions Only record information you know to be correct

Incident Details

DATE:	17-3-17	TIME:	7.30am - 2pm ☒	Duration:	PATHWAY: 547198, 547201, 547203, 547208 Wind Correlation Z17/68765

Description (provide a brief description of what happened during the incident (**MATERIAL HARM INCIDENT - 5 ESSENTIAL AGENCIES MUST BE NOTIFIED IMMEDIATELY)**	4 callers reported strong waste smell on and off all day (7.30am – 2pm). The caller (Ref 547198) is concerned for plans to extend the waste facility because of ongoing odour problems. Referred by EPA to Whytes Gully Waste Disposal Facility 133 Reddalls Road, KEMBLA GRANGE NSW 2526
EXACT location of the incident (include chainage, landmarks, features, nearest cross street) – provide a sketch if appropriate	No name(s) submitted by EPA Address -4 complaints received from Highview Drive, Farmborough Heights on 17 March 2017
Quantity or volume of material discharged or affected by incident (provide estimate if quantity is unknown)	Unknown
Estimated distance to nearest waterway. This can include stormwater drains and dry watercourses. (where relevant)	N/A
Type of activity that caused incident (what works were in progress at the time of the incident?)	Normal Operations
How was the incident identified? (eg employee, Contractor, community, complaint)	Community Complaint to EPA
Name and contact details of complainant (where relevant)	EPA James Wraith Operations Officer, Waste Compliance
Address of complainant	Farmborough Heights – Highview Drive
If Odour, describe complainants description of odour, What does it smell like? Intensity: 0 No odour 1 Very faint odour 2 Faint odour 3 Distinct odour 4 Strong odour 5 Very Strong odour	Odour Intensity: ☐1 ☐2 ☐3 ☒4 ☐5
Describe weather conditions at the time Temperature(very warm, warm, mild, cold) Wind Strength (none, light, steady, strong, gusting) Wind Direction (eg from NE)	Temperature 19.0 to 19.8 Wind speed 9.7 to 16.1Km/h from predominantly from the North 1ml up to 3.30 pm
Describe weather conditions during recent weeks Temperature(very warm, warm, mild, cold) Wind Strength (none, light, steady, strong, gusting) Wind Direction (eg from NE)	Average Temperature -18.2 low 26.8high Average Wind speed -6.1 Km/h Average wind direction –Predominantly from the North Total rainfall (1- 17 March 2017) – 210mm

Any other details of the incident (including any information which did not fit in spaces above, as well as any special circumstances of the day or the location)

Nil additional detail

What immediate actions/control measures were taken to rectify or contain the incident?

Review of tip face operations, additional slag utilised onsite during wet weather running surface during wet weather periods additional VENM cover utilised to enable effective stormwater drainage from current landfill operations.

- Nil waste odour detected offsite.
- Review of weather station data (see attached Wind Correlation Data) indication odour not generated by WWARRP.
- Additional information supplied to the EPA in a separate letter regarding neighbouring facilities notifying residents of their plans to expand their facilities and residents also protesting a subdivision of lots in Farmborough Heights.

What corrective action has been taken to prevent similar incidents recurring?

Continue to keep landfill operations as dry as possible in wet weather conditions. Continue to cover waste in accordance with EPL. Reinforce tip face start-up procedure with operatives ensuring deodoriser trailer is activated. Ongoing assessment periodically throughout the day to detecting odour onsite.

Incident Category

Potential Category 1 Incident (may involve one or more of the following (tick incident type)	
☒ Material, odour or noise that travels beyond site boundary causing or potentially causing adverse impact to the environment or community	☐ Unauthorised harm or damage to threatened species, endangered populations, endangered ecological communities or critical habitat.
☐ Discharge of waters from site not in accordance with any applicable REF determination/approval/environment protection licence condition	☐ Unauthorised harm or damage to threatened aquatic species and protected marine vegetation or unauthorised dredging of reclamation works within a watercourse.
☐ A fire that travels beyond site boundary	☐ Unauthorised damage or destruction to any State or locally significant relic or Heritage item
☐ Unauthorised harm or desecration to Aboriginal objects and Aboriginal places	☐ Material harm to the environment or persons as per Part 5.7 of POEO Act (including harm on site)
☐ Failure to comply with a REF determination/approval/environment protection licence condition.	☐ Works undertaken without required approval or environmental assessment.

Potential Category 2 Incident (may involve one or more of the following (tick incident type)	
☐ Failure to implement component of Environment Management Plan that does not result in a Category 1 incident	☐ Spills that do not leave the site boundary and are cleaned up without material environmental harm or residual environmental impact.
☐ A fire contained on site without causing impact to the environment	

Sign-Off (person making report)

Print Name: Della Kutzner	Sign:
Position: WHS, Environment and Quality Officer	Date: 21 March 2017

Notification to the 5 Essential Agencies (where material harm identified notify immediately)

To be completed by the relevant Manager or delegated authority
Were relevant authorities notified under part 5.7 of POEO Act?

Authority	Number			Date and Time Notified
Fire and Rescue	000	☐ Yes	☐ No	
Wollongong City Council	4227 7111	☐ Yes	☐ No	
EPA NSW	131 555	☒ Yes	☐ No	Lodge with EPA 17/3/17, sent to WCC 20/3/2017 Response back 26/3/2017
The Ministry of Health	4222 5000	☐ Yes	☐ No	
SafeWork NSW	13 10 50	☐ Yes	☐ No	
Fire and Rescue	1300 729 579	☐ Yes	☐ No	
Department of Planning	4224 9450	☐ Yes	☐ No	

Surrounding Land Holders (if necessary)	Refer to Pollution Incident Response Management Plan (PIRMP) for contacts	☐ Yes	☐ No	

Who notified the EPA? Name: Resident

Notification Method ☒ Phone ☐ on site	Date	17/3/17	Time	7.30am – 2.00pm ☐ am ☐ pm
Has there been a EPA Environmental Line Complaint? ☒ Yes ☐ No				EPA Complaint No: 103380-2017
Authorities notified and why: (eg Essential Agencies and Neighbouring properties - NA				

Sign off (Manager/delegated authority officer)

Print Name: Sandra Belanszky	Sign:
Position: Waste operations Manager	Date: 26 March 2017

Please submit all completed forms to relevant Area Manager

Z15/38744

ANNEXURE C

Contingency Sediment Pond Work Instruction

Issue: 1 Rev: 0 Date: 08/07/16	**Wollongong City Council – City Works and Services, Waste Services** *Wet Weather Monitoring and Stormwater Management* Wollongong Waste & Resource Recovery Park (Whytes Gully)

Wet Weather & Stormwater Management Work Instruction

1.0 PURPOSE AND SCOPE

The purpose of this work instruction is to describe the way in which wet weather monitoring and storm water management is carried out on Council's Waste Sites:

- The Wollongong Waste and Resource Recovery Park (Whytes Gully)

2.0 DEFINITIONS/REFERENCES

The following references may be consulted if required;

- Whytes Gully Licence Number 5862 under Section 55 of the Protection of the Environment Operations Act 1997 (see http://www.epa.nsw.gov.au/prpoeoapp/ and enter licence number 5862 for the latest version)
- Whytes Gully Consent to discharge trade waste - Agreement No 11205 (TRIM Ref Z16/149009)
- Whytes Gully LEMP September 2014 Report No: 117625003_061_R_Rev2 (TRIM Ref Z12/221925)

3.0 INSTRUCTION DETAILS

3.1 GENERAL DESCRIPTION OF STORMWATER MANAGEMENT

3.1.1 Storm runoff water is collected into three dams (see Figure 2 below). Water in the dams should be kept below 50% capacity to enable sufficient storage capacity to handle runoff from most rainfall events and thus minimise the potential for uncontrolled discharges.

Warning: To avoid environmental harm no release is to occur to the external stormwater system until Council's Environment Officer (or nominated representative) has tested the water and confirmed that it is suitable for release. A record of the test must to be retained on file.

3.1.2 After cessation of inflow from a rainfall event, stored water in all three dams is allowed to settle. Dams may require expedited treatment through the use of gypsum dosing to bring the turbidity down to levels suitable for release to the external storm water system. The water may also need to be treated with acid or caustic to ensure pH is within range.

3.1.3 When testing shows that the water quality of a dam meets Environment Protection Licence conditions for release, it may be released to the creek at a rate not exceeding 1,000 m^3 /day (or 1 ML /day) until the water level is returned below 50% capacity.

3.1.4 Water remaining in the dams after cessation of the rainfall event may be managed/utilised as follows:

- dust suppression
- used for on-site irrigation

3.1.5 When an overflow event occurs during rainfall, sampling must be carried out by a Council's Waste Operations Manager (or nominated representative) at discharge points numbered 1, 4 and 6 on Figure 2 at a frequency of no less than one sample per day.

Note: Point numbers 1, 4 and 6 on Figure 2 represent the Environment Protection Licence Identification Numbers displayed in Table 1:

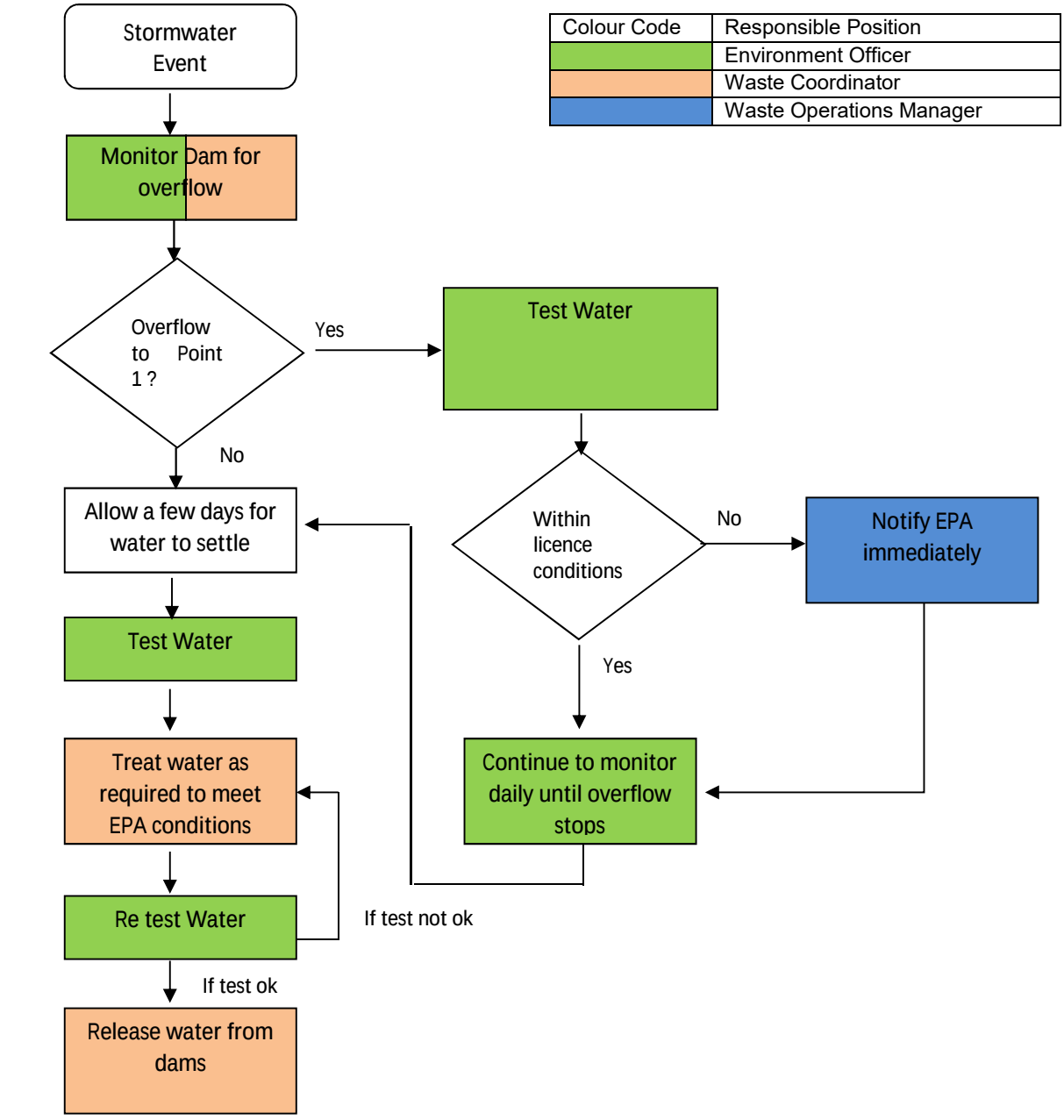
Table 1 Key Environment Protection Licence Identification Numbers

Figure 2 No.	EPL No.	Comment
1	1	Source
4	33	Downstream
6	34	Upstream

3.1.6 The samples are tested for compliance against the parameters specified in the Environment Protection Licence 5862. Where there is an exceedance of licence conditions, Council's Waste Operations Manager (or delegated representative) is to notify the EPA immediately.

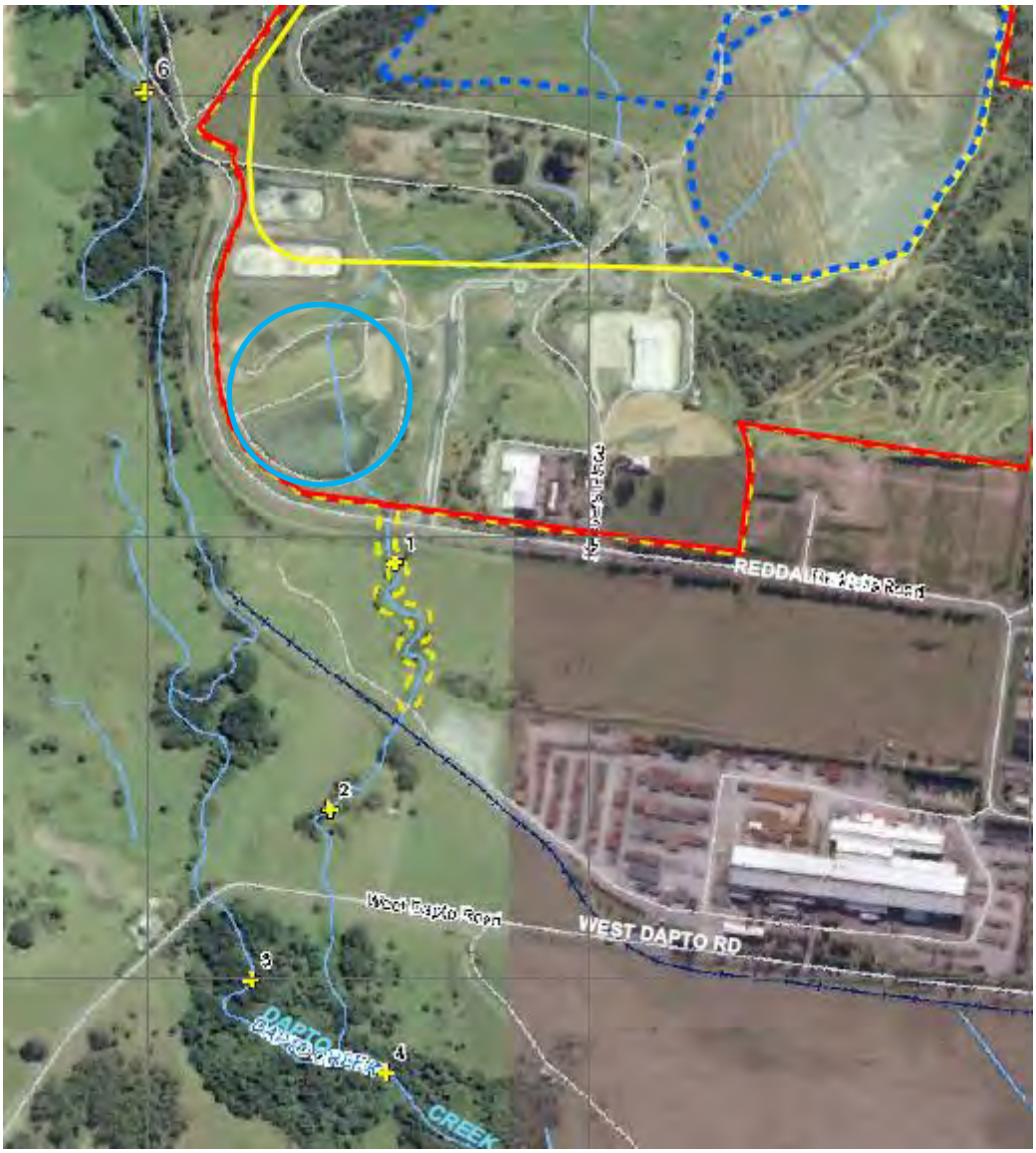
3.1.7 Where the samples are collected by the site Environmental Officer (or nominated Council representative) the Laboratory Submission Cover Sheet in Appendix 4.1 should be filled in and retained on file.

Figure 1 Stormwater Management Process



Note: Treatment will be by gypsum dosing to reduce suspended solids

Figure 2: Location monitoring points



3.2 RESPONSIBILITIES

3.2.1 For each rainfall event the Environmental Officer and Site Coordinator (or delegate) shall monitor the dam levels to establish if there is an overflow condition. Where an overflow condition occurs, the Environmental Officer (or delegate) notifies contracted sampler or the environmental representative who will in turn arrange for samples from monitoring points 1, 4 and 6.

3.2.2 Controlled release of water to creek is carried out by Council under the direction of the Operations Manager. The Operations Manager is responsible to ensure that appropriate testing is conducted and that the water quality falls within EPA guidelines before a controlled release occurs.

3.2.3 Council will be required to chemically dose dams using gypsum (dosage varies with sediment load, but dose average is 32kg/100m^3). The Site Coordinator will arrange for a suitably trained person to carry out this work.

3.2.4 Council is responsible for the supply of all chemicals required to treat storm water. The Waste Coordinator (or delegate) is required to monitor the stock of chemicals on site and record their use and replace stocks. The Environment Officer will ensure that all chemicals are listed on the hazardous chemicals register, MSDS are available on site for all chemicals, and that staff using the chemicals have been appropriately trained in their safe handling prior to use.

3.2.5 All major site drainage works such as stormwater ponds, dams, bund, drains, sediment retention traps, screens and erosion controls will be constructed by in accordance with relevant requirements (Refer appendices for construction methods). The Waste Coordinator is responsible for the operation and maintenance of the storm water management infrastructure which includes:

- Maintaining in a litter free condition
- Desilt & repair on an as required basis
- Maintain in a peak functional condition in accordance with design capacity
- Ensure that drainage occurs in a manner which prevents ponding and minimises erosion/scouring

3.2.6 All temporary drains will generally be earthen drains constructed at grades not steeper than 1%, to minimise scouring. Where steeper grades are required, the drains must be provided with appropriate scour protection, for example hay bales or rubble. All earthen drains will be grassed to minimise erosion.

Warning: A life buoy and throw rope is required when working in or around the dams in case someone slips or falls into the dam.

4.0 APPENDICES

4.1 Laboratory Submission Sheet

4.2 Construction of Drains on Outside of Batter

4.3 Construction of Drainage Channels

4.4 Typical Erosion Control Structure

4.5 Stormwater Treatment Plant

Wollongong City Council
City Works and Services Division – Waste Services
Laboratory Submission Sheet

Location/Site	Wollongong Waste and Resource Recovery Park (Whytes Gully)
Laboratory	ALS – Contract T
Purchase Order	
Sample Number	
Period Sampled	
Date Dispatched	

Dust Analysis Suite (Select One)

Selection	Test Type	Analytes/Results Required
☐	Monthly Dust	Total Insoluble Solids
☐	Other	Specify

Water Analysis Suite (Select One) (Note: All results in milligrams per litre unless specified)

Selection	Test Type	Analytes/Results Required
☐	Sediment Basin Discharge	pH, Total Suspended Solids.
☐	Surface Water Annual	Alkalinity (as Calcium Carbonate), Ammonia, Calcium, Chloride, Conductivity (µS/cm), Dissolved Oxygen, Filterable Iron, Fluoride, Magnesium, Nitrate, pH, Potassium, Sodium, Sulfate, Temperature (^{o}C), Total Organic Carbon , Total Phenolics and Total Suspended Solids.
☐	Quarterly Ground Water	Alkalinity (as Calcium Carbonate), Calcium, Chloride, Conductivity (µS/cm), Magnesium, Nitrogen (Ammonia), pH, Potassium, Sodium, Standing Water Level (m), Sulfate, Total Dissolved Solids and Total Organic Carbon
☐	Annual Ground Water	Aluminium, Arsenic, Barium, Benzene, Bicarbonate, Cadmium, Chromium (Hexavalent), Chromium (Total), Cobalt, Copper, Ethyl Benzene, Fluoride, Lead, Manganese, Mercury, Nitrate, Nitrite, Organochlorine Pesticides, Organophosphate pesticides, Polycyclic Aromatic Hydrocarbons, Toluene, Total Petroleum Hydrocarbons, Total Phenolics, Xylene and Zinc.
☐	Trade Waste (22 Days)	Ammonia, Biochemical Oxygen Demand, Suspended Solids, Temperature (^{o}C), Total Dissolved Solids, pH.
☐	Other	Specify

Special Instructions: Certified report required. All work to be undertaken to a current accredited testing method.

Contact	Signed	Name

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ANNUAL RETURN

LICENCE NO	**5862**
LICENCE HOLDER	WOLLONGONG CITY COUNCIL
REPORTING PERIOD	29-May-2016 to 28-May-2017

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual Return relates below:

REVISED REPORTING PERIOD ____ / ____ / ____ **to** ____ / ____ / ____

(Note: the revised reporting period also needs to be entered in Section H)

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 28-Jul-2017

Your Annual Return must be completed, including certification in Section H, and submitted to the EPA no later than 60 Days after the end of the reporting period for your licence.

Failure to submit this Annual Return within 60 days after the reporting period ends may result in:

- **the issue of a Penalty Notice for $1500 (individuals) or $3000 (corporations);**

OR

- **prosecution.**

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

THERE IS A MAXIMUM PENALTY OF $250,000 FOR A CORPORATION OR $120,000 FOR AN INDIVIDUAL.

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997*.

Annual Return

WOLLONGONG CITY COUNCIL

Use the checklist below to ensure that you have completed your Annual Return correctly.
(✓ the boxes)

CHECKLIST		
☑	Section A:	All licence details are correct
☐	Section B1:	You have entered the correct number in the complaints table
☐	Section B2 – B3:	If there are tables, you have provided the required details
☐	Section C:	You have answered question 1, and 2 if applicable
☐	Section D:	If applicable, you have completed all load calculation worksheets
☐	Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☐	Section F:	You have answered question 1, 2 and 3 if applicable
☐	Section G:	You have answered question 1 and question 2, 3 and 4 or question 5 through to 11 if applicable
☐	Section H:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
☐	Make a copy of the completed Annual Return and keep it with your licence records	

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

A Statement of Compliance - Licence Details

ALL licence holders must check that the licence details in Section A are correct

If there are changes to any of these details**you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.**

Licence variation and transfer application forms are available on the EPA website at: http://www.epa.nsw.gov.au/licensing or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700.

If you are applying to vary or transfer your licence you must still complete this Annual Return.

A1 Licence Holder

Licence Number	5862
Licence Holder	WOLLONGONG CITY COUNCIL
Trading Name *(if applicable)*	
ABN	63 139 525 939

A2 Premises to which Licence Applies (if applicable)

Common Name (if any)	WHYTES GULLY WASTE DISPOSAL FACILITY
Premises	REDDALLS ROAD KEMBLA GRANGE NSW 2526

A3 Activities to which Licence Applies

Waste disposal (application to land)

A4 Other Activities (if applicable)

A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Waste disposal by application to land		capacity

A6 Assessable Pollutants (Not Applicable)

B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

Number of complaints recorded by the licensee during the reporting period. **If no complaints were received enter nil in the attached box, otherwise complete the table below.**	27

Pollution Complaint Category	Number of Complaints
Air	27
Water	NIL
Noise	NIL
Waste	NIL
Other	NIL

B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is **not** required by your licence, **no tables** will appear below.
Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Discharge & Monitoring Point 1

Stormwater monitoring and discharge point, Outlet at Reddalls Road - Monitoring point labelled 1 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297777 N6183972

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	1	6	102	180.50	278

Ammonia	milligrams per litre	1	6	0.05	0.51	1.3
Calcium	milligrams per litre	1	6	20	29.83	32
Chloride	milligrams per litre	1	6	33	78.83	175
Conductivity	microsiemens per centimetre	1	6	367	650.50	1160
Dissolved Oxygen	milligrams per litre	1	6	5.79	7.76	9.59
Filterable iron	milligrams per litre	1	6	0.05	0.13	0.25
Fluoride	milligrams per litre	1	6	0.2	0.32	0.5
Magnesium	milligrams per litre	1	6	10	16.83	27
Nitrate	milligrams per litre	1	6	0.2	0.71	1.36
pH	pH	1	6	7.3	7.7	8.1
Potassium	milligrams per litre	1	6	7	11.83	18
Sodium	milligrams per litre	1	6	34	76	150
Sulfate	milligrams per litre	1	6	20	31.17	42
Temperature	degrees Celsius	1	6	13.7	17.28	22.1
Total organic carbon	milligrams per litre	1	6	2	13	18
Total Phenolics	milligrams per litre	1	6	0.05	0.05	0.05

Total suspended solids	milligrams per litre	1	6	7	41.17	80

Monitoring Point 2 DECOMMISSIONED 23 FEBRUARY 2017

Groundwater quality monitoring, Monitoring point labelled GABH01 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297751.8 N6184474

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre					
Aluminium	milligrams per litre					
Arsenic	milligrams per litre					
Barium	milligrams per litre					
Benzene	milligrams per litre					
Cadmium	milligrams per litre					
Calcium	milligrams per litre					
Chloride	milligrams per litre					
Chromium (hexavalent)	milligrams per litre					
Chromium (total)	milligrams per litre					
Cobalt	milligrams per litre					
Conductivity	microsiemens per centimetre					

Copper	milligrams per litre					
Ethyl benzene	micrograms per litre					
Fluoride	milligrams per litre					
Lead	milligrams per litre					
Magnesium	milligrams per litre					
Manganese	micrograms per litre					
Mercury	milligrams per litre					
Nitrate	milligrams per litre					
Nitrite	milligrams per litre					
Nitrogen (ammonia)	milligrams per litre					
Organochlorine pesticides	milligrams per litre					
Organophosphate pesticides	milligrams per litre					
pH	pH					
Polycyclic aromatic hydrocarbons	milligrams per litre					
Potassium	milligrams per litre					
Sodium	milligrams per litre					

Standing Water Level	metres					
Sulfate	milligrams per litre					
Toluene	milligrams per litre					
Total dissolved solids	milligrams per litre					
Total organic carbon	milligrams per litre					
Total petroleum hydrocarbons	milligrams per litre					
Total Phenolics	milligrams per litre					
Xylene	milligrams per litre					
Zinc	milligrams per kilogram					

Monitoring Point 3

Surface gas monitoring, Areas where intermediate or final cover has been placed.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0	0.001038	0.287

Monitoring Point 4

Gas accumulation monitoring, Inside all buildings within 250 metres of deposited waste.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	12	12	0.00014	0.000239	0.00044

Monitoring Point 5

Groundwater quality monitoring, Monitoring point labelled GABH02 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297754.9 N6184377

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	1060	1127	1200
Aluminium	milligrams per litre	1	1	3.37	3.37	3.37
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.016	0.016	0.016
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	300	321	360
Chloride	milligrams per litre	4	4	1130	1170	1240
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.003	0.003	0.003
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	microsiemens per centimetre	4	4	5200	5557.50	5710

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

Copper	milligrams per litre	1	1	0.01	0.01	0.01
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	170	125.25	192
Manganese	micrograms per litre	1	1	0.096	0.096	0.096
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.02	0.01
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.6	7.15	7.8
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	2	2.5	3
Sodium	milligrams per litre	4	4	558	607	639

Standing Water Level	metres	4	4	4.99	6.59	10.9
Sulfate	milligrams per litre	4	4	150	156.50	168
Toluene	milligrams per litre	1	1	< 2	< 2	< 2
Total dissolved solids	milligrams per litre	4	4	3330	3487.50	3840
Total organic carbon	milligrams per litre	4	4	6	29.50	98
Total petroleum hydrocarbons	milligrams per litre	1	1	< 50	< 50	< 50
Total Phenolics	milligrams per litre	1	1	< 0.05	< 0.05	< 0.05
Xylene	milligrams per litre	1	1	< 2	< 2	< 2
Zinc	milligrams per kilogram	1	1			

Monitoring Point 6 - DECOMMISSIONED 23 FEBRUARY 2017

Groundwater quality monitoring, Monitoring point labelled GABH03 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297793.8 N6184315

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	3	772	671	809
Aluminium	milligrams per litre	1	1	0.12	0.12	0.13
Arsenic	milligrams per litre	1	1	< 0.001	< 0.001	< 0.001
Barium	milligrams per litre	1	1	0.012	0.012	0.012

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WOLLONGONG CITY COUNCIL

NSW EPA

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.001	<0.001	<0.001
Calcium	milligrams per litre	4	3	351	352	369
Chloride	milligrams per litre	4	3	1200	1242	1190
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.002	0.002	0.002
Conductivity	microsiemens per centimetre	1	1	5940	5940	5940
Copper	milligrams per litre	1	1	0.001	0.002	0.002
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	3	306	2.33	2.4
Manganese	micrograms per litre	1	1	0.335	0.335	0.335
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	3	0.01	0.02	0.03
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	3	6.9	7.17	7.5
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	3	2	2	2
Sodium	milligrams per litre	4	3	491	512	530
Standing Water Level	metres	4	3	0.5	0.7	0.92
Sulfate	milligrams per litre	4	3	123	166.67	193
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	3	3500	3974	4790
Total organic carbon	milligrams per litre	4	3	5	7	10
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.026	[illegible]	0.026

Monitoring Point 7 [illegible]

Groundwater quality monitoring, Monitoring point labelled GABH06D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297975.6 N6184322

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	3	362	399	416
Aluminium	milligrams per litre	1	1	1.04	1.44	1.44
Arsenic	milligrams per litre	1	1	0.002	0.002	0.002
Barium	milligrams per litre	1	1	0.077	0.077	0.077
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	3	81	91.33	97
Chloride	milligrams per litre	4	3	204	616.33	1140
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	[illegible]	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	[illegible]	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	3	2160	2210	2260

Copper	milligrams per litre	1	1	0.002	0.002	0.002
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	< 0.001	< 0.001	< 0.001
Magnesium	milligrams per litre	1	2	55	62	73
Manganese	micrograms per litre	1	1	0.011	0.011	0.011
Mercury	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Nitrate	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Nitrite	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Nitrogen (ammonia)	milligrams per litre	1	2	< 0.1	< 0.2	< 0.2
Organochlorine pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
Organophosphate pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
pH	pH	1	2	6.7	7.3	7.6
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	< 1	< 1	< 1
Potassium	milligrams per litre	1	2	1	1	1
Sodium	milligrams per litre	1	2	759	42.67	465

Standing Water Level	metres	4	3	1.73	2.17	2.5
Sulfate	milligrams per litre	4	3	1.7	135.33	174
Toluene	milligrams per litre	1	1	< 2	< 2	< 2
Total dissolved solids	milligrams per litre	4	3	1539	1516.67	1620
Total organic carbon	milligrams per litre	4	3	1	1.67	2
Total petroleum hydrocarbons	milligrams per litre	1	1	< 50	< 50	< 50
Total Phenolics	milligrams per litre	1	1	< 0.05	< 0.05	< 0.05
Xylene	milligrams per litre	1	1	2	2	2
Zinc	milligrams per kilogram	1	1	0.01	0.01	0.01

Monitoring Point 8

Groundwater quality monitoring, Monitoring point labelled GABH06S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297977 N6184322

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	3	336	436.33	495
Aluminium	milligrams per litre	1	1	2.73	2.73	2.73
Arsenic	milligrams per litre	1	1	< 0.001	< 0.001	< 0.001
Barium	milligrams per litre	1	1	0.099	0.099	0.099

Benzene	milligrams per litre	1	1	< 1	< 1	< 1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	3	77	87	98
Chloride	milligrams per litre	4	3	606	624	645
Chromium (hexavalent)	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Chromium (total)	milligrams per litre	1	1	0.002	0.002	0.002
Cobalt	milligrams per litre	1	1	0.005	0.005	0.005
Conductivity	microsiemens per centimetre	4	3	3100	2960	3200
Copper	milligrams per litre	1	1	0.011	0.011	0.011
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	0.9	0.9	0.9
Lead	milligrams per litre	1	1	0.002	0.003	0.003
Magnesium	milligrams per litre	4	3	59	68.27	74
Manganese	micrograms per litre	1	1	0.241	0.241	0.241
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0.01		
Nitrogen (ammonia)	milligrams per litre	4	3		0.02	
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	3		7.1	
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	3	1	1	1
Sodium	milligrams per litre	4	3		444 67	
Standing Water Level	metres	4	3			
Sulfate	milligrams per litre	4	3	189	196	206
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	3			
Total organic carbon	milligrams per litre	4	3	2	2	4
Total petroleum hydrocarbons	milligrams per litre	1	1	<2	<2	<2
Total Phenolics	milligrams per litre	1	1			
Xylene	milligrams per litre	1		<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.019	0.019	0.019

Monitoring Point 9

Groundwater quality monitoring, Monitoring point labelled GMW102 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297952.6 N6184807

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	107	203.67	248
Aluminium	milligrams per litre	1	1			
Arsenic	milligrams per litre	1	1			
Barium	milligrams per litre	1	1			
Benzene	milligrams per litre	1	1			
Cadmium	milligrams per litre	1	1			
Calcium	milligrams per litre	4	4	22	49	65
Chloride	milligrams per litre	4	4	14	19.67	22
Chromium (hexavalent)	milligrams per litre	1	1			
Chromium (total)	milligrams per litre	1	1			
Cobalt	milligrams per litre	1	1			
Conductivity	microsiemens per centimetre	4	4	262	435.33	559

Copper	milligrams per litre	1	1			
Ethyl benzene	micrograms per litre	1	1			
Fluoride	milligrams per litre	1	1			
Lead	milligrams per litre	1	1			
Magnesium	milligrams per litre	4	4			
Manganese	micrograms per litre	1	1			
Mercury	milligrams per litre	1	1			
Nitrate	milligrams per litre	1	1			
Nitrite	milligrams per litre	1	1			
Nitrogen (ammonia)	milligrams per litre	4	4			
Organochlorine pesticides	milligrams per litre	1	1			
Organophosphate pesticides	milligrams per litre	1	1			
pH	pH	1	4			
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1			
Potassium	milligrams per litre	4	4			
Sodium	milligrams per litre	4	4			

Standing Water Level	metres	4	4	2.50	7.06	11.68
Sulfate	milligrams per litre	4	4	9	10.67	13
Toluene	milligrams per litre	1	1	<0.4		
Total dissolved solids	milligrams per litre	4	4	315	449.33	627
Total organic carbon	milligrams per litre	4	4	2	3.33	5
Total petroleum hydrocarbons	milligrams per litre	1	1			
Total Phenolics	milligrams per litre	1	1		DRY	
Xylene	milligrams per litre	1	1			
Zinc	milligrams per kilogram	1	1			

Monitoring Point 10

Groundwater quality monitoring, Monitoring point labelled GMW103 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470.2 N6184603

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	444	483.50	525
Aluminium	milligrams per litre	1	1	6.34	6.34	6.34
Arsenic	milligrams per litre	1	1	0.00	0.00	0.001
Barium	milligrams per litre	1	1	0.052	0.052	0.052

Benzene	milligrams per litre	1	1	< 1	< 1	< 1
Cadmium	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Calcium	milligrams per litre	4	4	162	160	224
Chloride	milligrams per litre	4	4	327	371	535
Chromium (hexavalent)	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Chromium (total)	milligrams per litre	1	1	0.007	0.007	0.007
Cobalt	milligrams per litre	1	1	0.009	0.009	0.009
Conductivity	microsiemens per centimetre	4	4	1624	2035	2720
Copper	milligrams per litre	1	1	0.028	0.026	0.028
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre		1	0.3	0.3	0.3
Lead	milligrams per litre	1		0.014	0.014	0.014
Magnesium	milligrams per litre	4	4	50	62.2	75
Manganese	micrograms per litre		1	0.517	0.517	0.517
Mercury	milligrams per litre			< 0.0001	< 0.0001	< 0.0001
Nitrate	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.02	0.05
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.05	<0.05
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.7	7.1	7.5
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	153	167.50	124
Standing Water Level	metres	4	4	7.1	7.5	7.9
Sulfate	milligrams per litre	4	4	11.4	126.75	14.9
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	998	1367	2140
Total organic carbon	milligrams per litre	4	4	1	1.75	2
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.042	0.045	0.045

Monitoring Point 11

Groundwater quality monitoring, Monitoring point labelled GMW104 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297597.9 N6184508

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	1	232.75	543
Aluminium	milligrams per litre	1	1	6.72	6.72	6.72
Arsenic	milligrams per litre	1	1	0.001	0.018	0.018
Barium	milligrams per litre	1	1	0.624	0.624	0.624
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	0.001	0.001	0.001
Calcium	milligrams per litre	4	4	29	47.25	55
Chloride	milligrams per litre	4	4	50	118.75	250
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.305	0.305	0.305
Cobalt	milligrams per litre	1	1	0.446	0.446	0.446
Conductivity	microsiemens per centimetre	4	4	553	1001.50	1305

Copper	milligrams per litre	1	1	0.962	0.962	0.962
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	0.7	0.7	0.7
Lead	milligrams per litre	1	1	0.23	0.23	0.23
Magnesium	milligrams per litre	4	4	18	29.25	29
Manganese	micrograms per litre	1	1	21.2	21.2	21.2
Mercury	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Nitrate	milligrams per litre	1	1	0.02	0.02	0.02
Nitrite	milligrams per litre	1	1	0.02	0.02	0.02
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.11	0.22
Organochlorine pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
Organophosphate pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
pH	pH	4	4	6.2	7.08	7.5
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	< 1	< 1	< 1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	74	133	176

Standing Water Level	metres	4	4	7.04	7.47	7.8
Sulfate	milligrams per litre	4	4	39	102	250
Toluene	milligrams per litre	4	4	4.2	206.75	1.8
Total dissolved solids	milligrams per litre	1	1	120	1180	1180
Total organic carbon	milligrams per litre	4	4	2	2.5	3
Total petroleum hydrocarbons	milligrams per litre	1	1	< 50	< 50	< 50
Total Phenolics	milligrams per litre	1	1	< 0.05	< 0.05	< 0.05
Xylene	milligrams per litre	1	1	< 2	< 2	< 2
Zinc	milligrams per kilogram	1	1	1.7	1.7	1.7

Monitoring Point 12

Groundwater quality monitoring, Monitoring point labelled GMW105 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298433.3 N6184397

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	32	38.67	45
Aluminium	milligrams per litre	1	1	1.5	1.5	1.5
Arsenic	milligrams per litre	1	1	0.006	0.006	0.006
Barium	milligrams per litre	1	1	0.501	0.501	0.501

Benzene	milligrams per litre	1	1	< 1	< 1	< 1
Cadmium	milligrams per litre	1	1	0.0004	0.0004	0.0004
Calcium	milligrams per litre	4	4	5	6.67	8
Chloride	milligrams per litre	4	4	24	34	41
Chromium (hexavalent)	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Chromium (total)	milligrams per litre	1	1	0.008	0.008	0.008
Cobalt	milligrams per litre	1	1	0.048	0.048	0.048
Conductivity	microsiemens per centimetre	4	4	31	287.33	289
Copper	milligrams per litre	1	1	0.179	0.179	0.179
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	0.2	0.2	0.2
Lead	milligrams per litre	1	1	0.073	0.073	0.073
Magnesium	milligrams per litre	4	4	2	2.67	3
Manganese	micrograms per litre	1	1	2.42	2.42	2.42
Mercury	milligrams per litre	1	1	0.0004	0.0004	0.0004
Nitrate	milligrams per litre	1	1	0.85	0.85	0.85

Nitrite	milligrams per litre	1	1	0.03	0.03	0.03
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.05	0.12
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	5.7	6.2	7
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	31	33.73	30
Standing Water Level	metres	4	4	10.65	10.78	10.9
Sulfate	milligrams per litre	4	4	12	13.33	14
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	173	338.67	543
Total organic carbon	milligrams per litre	4	4	1	2.33	4
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre		1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.31	0.31	0.31

Monitoring Point 13

Groundwater quality monitoring, Monitoring point labelled GMW106 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298356.8 N6184294

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	594	594	594
Aluminium	milligrams per litre	1	1			
Arsenic	milligrams per litre	1	1			
Barium	milligrams per litre	1	1			
Benzene	milligrams per litre	1	1			
Cadmium	milligrams per litre	1	1			
Calcium	milligrams per litre	4	4	64	64	64
Chloride	milligrams per litre	4	4	408	408	408
Chromium (hexavalent)	milligrams per litre	1	1			
Chromium (total)	milligrams per litre	1	1			
Cobalt	milligrams per litre	1	1			
Conductivity	microsiemens per centimetre	4	4	3550	3550	3550

Copper	milligrams per litre	1	1			
Ethyl benzene	micrograms per litre	1	1			
Fluoride	milligrams per litre	1	1 OR 4			
Lead	milligrams per litre	1	1			
Magnesium	milligrams per litre	4	4	65	65	65
Manganese	micrograms per litre	1	1			
Mercury	milligrams per litre	1	1			
Nitrate	milligrams per litre	1	1 OR 4			
Nitrite	milligrams per litre	1	1			
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.01	0.01
Organochlorine pesticides	milligrams per litre	1	1			
Organophosphate pesticides	milligrams per litre	1	1 OR 4			
pH	pH	4	4	8.2	8.2	8.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	1 OR 4	—	—
Potassium	milligrams per litre	4	4	3	3	3
Sodium	milligrams per litre	4	4	620	620	620

Standing Water Level	metres	4	4	5.3	5.3	5.3
Sulfate	milligrams per litre	4	4	596	596	596
Toluene	milligrams per litre	1	1	DRY		
Total dissolved solids	milligrams per litre	4	4	2100	2100	2100
Total organic carbon	milligrams per litre	4	4	4	4	4
Total petroleum hydrocarbons	milligrams per litre	1	1			
Total Phenolics	milligrams per litre	1	1			
Xylene	milligrams per litre	1	1		DRY	
Zinc	milligrams per kilogram	1	1			

Monitoring Point 14

Groundwater quality monitoring, Monitoring point labelled GMW108S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297870.2 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	287	423	596
Aluminium	milligrams per litre	1	1	2.4	2.4	2.4
Arsenic	milligrams per litre	1	1	0.001	0.001	0.001
Barium	milligrams per litre	1	1	0.22	0.22	0.22

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	46	95.75	147
Chloride	milligrams per litre	4	4	32	409.5	[illegible]
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre			0.017	0.017	0.017
Cobalt	milligrams per litre		1	0.009	0.009	0.009
Conductivity	microsiemens per centimetre	4	4	[illegible]	[illegible]	[illegible]
Copper	milligrams per litre	1	1	0.041	0.041	0.041
Ethyl benzene	micrograms per litre		1	<2	<2	<2
Fluoride	milligrams per litre		1	0.6	0.6	0.6
Lead	milligrams per litre		1	0.013	0.013	0.013
Magnesium	milligrams per litre	4	4	17	[illegible]	[illegible]
Manganese	micrograms per litre			0.315	0.315	0.315
Mercury	milligrams per litre	1		<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.2	0.05	0.1
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.7	6.98	7.5
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	2.5	5
Sodium	milligrams per litre	4	4	68	266.75	441
Standing Water Level	metres	4	4	1.28	2.44	2.79
Sulfate	milligrams per litre	4	4	19	109.50	204
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	269	1347.25	2540
Total organic carbon	milligrams per litre	4	4	3	5.75	10
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.053	0.053	0.053

Monitoring Point 15

Groundwater quality monitoring, Monitoring point labelled GMW108D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297871.4 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	446	604.50	567
Aluminium	milligrams per litre	1	1	0.12	0.12	0.12
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.013	0.013	0.013
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	111	121.50	126
Chloride	milligrams per litre	4	4	621	650.25	675
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1		<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1		<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	3060	3152.50	3330

Copper	milligrams per litre	1	1	0.003	0.003	0.003
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	0.6	0.6	0.6
Lead	milligrams per litre	1	1	< 0.001	< 0.001	< 0.001
Magnesium	milligrams per litre	4	4	21	23.25	24
Manganese	micrograms per litre	1	1	0.006	0.006	0.006
Mercury	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01
Nitrite	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.02	0.04
Organochlorine pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
Organophosphate pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
pH	pH	4	4	7.6	7.3	7.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	< 1	< 1	< 1
Potassium	milligrams per litre	4	4	1	1.25	2
Sodium	milligrams per litre	4	4	39.7	41.7	43.2

Standing Water Level	metres	4	4	2.03	2.23	2.5
Sulfate	milligrams per litre	4	4	159	177.75	189
Toluene	milligrams per litre	1	1	< 2	< 2	< 2
Total dissolved solids	milligrams per litre	4	4	1489	1833	2024
Total organic carbon	milligrams per litre	4	4	2	3.45	14
Total petroleum hydrocarbons	milligrams per litre	1	1	< 50	< 50	< 50
Total Phenolics	milligrams per litre	1	1	< 0.05	< 0.05	< 0.05
Xylene	milligrams per litre	1	1	< 4	< 4	< 4
Zinc	milligrams per kilogram	1	1	0.005	0.005	0.005

Monitoring Point 16

Groundwater quality monitoring, Monitoring point labelled GMW109S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297605.7 N6184068

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	217	287	358
Aluminium	milligrams per litre	1	1	106	106	106
Arsenic	milligrams per litre	1	1	0.01	0.01	0.01
Barium	milligrams per litre	1	1	1.65	1.65	1.65

Benzene	milligrams per litre	1	1	< 1	< 1	< 1
Cadmium	milligrams per litre	1	1	0.0033	0.0033	0.0033
Calcium	milligrams per litre	4	4	84	90.75	95
Chloride	milligrams per litre	4	4	247	327.50	376
Chromium (hexavalent)	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Chromium (total)	milligrams per litre	1	1	0.17	0.17	0.17
Cobalt	milligrams per litre	1	1	0.195	0.195	0.195
Conductivity	microsiemens per centimetre	4	4	1540	1620	1760
Copper	milligrams per litre	1	1	0.474	0.474	0.474
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	< 1	< 1	< 1
Lead	milligrams per litre	1	1	0.19	0.19	0.19
Magnesium	milligrams per litre	4	4	36	40.75	51
Manganese	micrograms per litre	1	1	7.32	7.32	7.32
Mercury	milligrams per litre	1	1	0.0004	0.0004	0.0004
Nitrate	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.20	0.62	1.16
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	5.9	6.2	6.4
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	2	2	2
Sodium	milligrams per litre	4	4	194	165	173
Standing Water Level	metres	4	4	3.03	3.49	4.01
Sulfate	milligrams per litre	4	4	43	28.22	105
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	1	4	910	882	1010
Total organic carbon	milligrams per litre	4	4	5	9.75	14
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	1·03	1·03	1·03

Monitoring Point 17

Groundwater quality monitoring, Monitoring point labelled GMW110 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297572.6 N6184266

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	602	630	677
Aluminium	milligrams per litre	1	1	17	17	17
Arsenic	milligrams per litre	1	1	0·001	0·001	0·001
Barium	milligrams per litre	1	1	0·051	0·051	0·051
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0·0001	<0·0001	<0·0001
Calcium	milligrams per litre	4	4	194	206·75	228
Chloride	milligrams per litre	4	4	870	891	917
Chromium (hexavalent)	milligrams per litre	1	1	<0·01	<0·01	<0·01
Chromium (total)	milligrams per litre	1	1	0·012	0·012	0·012
Cobalt	milligrams per litre	1	1	0·01	0·01	0·01
Conductivity	microsiemens per centimetre	4	4	3970	4237·50	4440

Copper	milligrams per litre	1	1	0.022	0.022	0.022
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	0.002	0.008	0.008
Magnesium	milligrams per litre	4	4	13.2	14.5	15.4
Manganese	micrograms per litre	1	1	0.434	0.434	0.434
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.35	0.35	0.35
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.02	0.01	0.01
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.8	7.05	7.7
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1.25	2
Sodium	milligrams per litre	4	4	434	460	456

Standing Water Level	metres	4	4	3.97	4.16	4.4
Sulfate	milligrams per litre	4	4	262	272	288
Toluene	milligrams per litre	1	1	< 2	< 2	< 2
Total dissolved solids	milligrams per litre	4	4	2510	2705	3020
Total organic carbon	milligrams per litre	4	4	2	3.25	4
Total petroleum hydrocarbons	milligrams per litre	1	1	< 50	< 50	< 50
Total Phenolics	milligrams per litre	1	1	< 0.05	< 0.05	< 0.05
Xylene	milligrams per litre	1	1	< 2	< 2	< 2
Zinc	milligrams per kilogram	1	1	0.051	0.051	0.051

Monitoring Point 18

Groundwater quality monitoring, Monitoring point labelled GMW111 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297588.6 N6184385

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	494	540.50	571
Aluminium	milligrams per litre	1	1	96.2	96.2	96.2
Arsenic	milligrams per litre	1	1	0.018	0.018	0.018
Barium	milligrams per litre	1	1	0.198	0.198	0.198

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Benzene	milligrams per litre	1	1	< 1	< 1	< 1
Cadmium	milligrams per litre	1	1	0.006	0.0006	0.0006
Calcium	milligrams per litre	4	4	116	122.75	130
Chloride	milligrams per litre	4	4	639	656.25	670
Chromium (hexavalent)	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Chromium (total)	milligrams per litre	1	1	0.45	0.448	0.45
Cobalt	milligrams per litre	1	1	0.375	0.375	0.375
Conductivity	microsiemens per centimetre	4	4	3370	3645	3470
Copper	milligrams per litre	1	1	0.209	0.209	0.209
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1			
Magnesium	milligrams per litre	4	4	96	98.50	100
Manganese	micrograms per litre	1	1	0.022	0.022	0.022
Mercury	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Nitrate	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.07	0.06
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.9	7.13	7.5
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	389	411.50	421
Standing Water Level	metres	4	4	6.27	6.47	6.7
Sulfate	milligrams per litre	4	4	192	171.25	210
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1690	1852.50	2230
Total organic carbon	milligrams per litre	4	4	1	7.75	25
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.376	0.376	0.376

Monitoring Point 19

Groundwater quality monitoring, Monitoring point labelled GMW109D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297604.9 N6184068

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	218	237.75	250
Aluminium	milligrams per litre	1	1	0.29	0.29	0.29
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.145	0.145	0.145
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	90	91.25	92
Chloride	milligrams per litre	4	4	419	429.50	434
Chromium (hexavalent)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	1690	1749.50	1810

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Copper	milligrams per litre	1	1	0.009	0.004	0.004
Ethyl benzene	micrograms per litre	1	1	< 2	< 2	< 2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	46	45	47
Manganese	micrograms per litre	1	1	0.352	0.352	0.352
Mercury	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Nitrate	milligrams per litre	1	1	0.13	0.13	0.13
Nitrite	milligrams per litre	1	1	0.13	0.13	0.13
Nitrogen (ammonia)	milligrams per litre	1	4	0.04	0.04	0.05
Organochlorine pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
Organophosphate pesticides	milligrams per litre	1	1	< 0.5	< 0.5	< 0.5
pH	pH	4	4	7.9	7.05	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	< 1	< 1	< 1
Potassium	milligrams per litre	4	4	1	1.25	2
Sodium	milligrams per litre	4	4	184	182.75	190

Standing Water Level	metres	4	4	2.9	3.13	3.46
Sulfate	milligrams per litre	4	4	22	23.50	24
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	[illegible]	1031.50	[illegible]
Total organic carbon	milligrams per litre	4	4	1	2.5	[illegible]
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	[illegible]	1	0.017	0.019	[illegible]

Monitoring Point 20

Groundwater quality monitoring, Monitoring point labelled BH6 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297807.4 N6184052

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	604	[illegible]	[illegible]
Aluminium	milligrams per litre	1	1	1.44	1.44	1.44
Arsenic	milligrams per litre	1	1	0.002	0.002	0.002
Barium	milligrams per litre	1	1	0.073	0.073	0.073

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	91	115.75	128
Chloride	milligrams per litre	4	4	902	1065.50	1170
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.002	0.002	0.002
Cobalt	milligrams per litre	1	1	0.019	0.019	0.019
Conductivity	microsiemens per centimetre	4	4	7930	4707.50	5350
Copper	milligrams per litre	1	1	0.004	0.004	0.004
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.9	0.9	0.9
Lead	milligrams per litre	1	1	0.01	0.01	0.01
Magnesium	milligrams per litre	4	4	100	114.75	127
Manganese	micrograms per litre	1	1	2.84	2.84	2.84
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

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Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.08	0.12	0.16
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.5	6.83	7.3
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4		1	1
Sodium	milligrams per litre	4	4	657	767-75	9.19
Standing Water Level	metres	4	4	1.29	1.51	1.65
Sulfate	milligrams per litre	4	4	117	175	244
Toluene	milligrams per litre	1	1	2	2	2
Total dissolved solids	milligrams per litre	4	4	2 16	3477-52	5940
Total organic carbon	milligrams per litre	4	4	9	10	11
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.01	0.01	0.01

Monitoring Point 21

Subsurface gas monitoring, Monitoring point labelled LFG MW1 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298084 N6184278

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.0045	0.012

Monitoring Point 22

Subsurface gas monitoring, Monitoring point labelled LFG MW2 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298202 N6184228

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.00038	0.001

Monitoring Point 23

Subsurface gas monitoring, Monitoring point labelled LFG MW3 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298297 N6184244

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.00023	0.0007

Monitoring Point 24

Subsurface gas monitoring, Monitoring point labelled LFG MW4 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0002	0.00033	0.0078

Monitoring Point 25

Subsurface gas monitoring, Monitoring point labelled LFG MW5 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298438 N6184381

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0002	0.000825	0.0018

Monitoring Point 26

Subsurface gas monitoring, Monitoring point labelled LFG MW6 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0002	0.000792	0.0024

Monitoring Point 27

Subsurface gas monitoring, Monitoring point labelled LFG MW7 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470 N6184553

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0006	0.00193	0.0054

Monitoring Point 28

Subsurface gas monitoring, Monitoring point labelled LFG MW8 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0005	0.001675	0.0046

Monitoring Point 29

Subsurface gas monitoring, Monitoring point labelled LFG MW9 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298465 N6184645

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0005	0.001333	0.0027

Monitoring Point 30

Subsurface gas monitoring, Monitoring point labelled LFG MW10 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298448 N6184684

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0002	0.00145	0.0066

Monitoring Point 31

Subsurface gas monitoring, Monitoring point labelled LFG MW11 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298400 N6184695

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	12	12	0.0003	0.000617	0.0013

Monitoring Point 32

Subsurface gas monitoring, Monitoring point labelled LFG MW12 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298351 N6184701

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0004	0.002642	0.014

Monitoring Point 33

Stormwater monitoring point, Downstream monitoring point labelled 4 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297767 N6183396

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	1	6	69	82.83	96
Ammonia	milligrams per litre	1	6	0.02	0.04	0.07
Calcium	milligrams per litre	1	6	14	20.83	30
Chloride	milligrams per litre	1	6	29	34 - 50	42
Conductivity	microsiemens per centimetre	1	6	265	335.50	403
Dissolved Oxygen	milligrams per litre	1	6	5.29	8.99	9.96
Filterable iron	milligrams per litre	1	6	0.12	0.19	0.3

Fluoride	milligrams per litre	1	6	0.1	0.12	0.2
Magnesium	milligrams per litre	1	6	7	9.33	13
Nitrate	milligrams per litre	1	6	0.02	0.34	0.7
pH	pH	1	6	6.4	7.22	7.7
Potassium	milligrams per litre	1	6	3	3.83	6
Sodium	milligrams per litre	1	6	21	28.67	37
Sulfate	milligrams per litre	1	6	16	25.33	47
Temperature	degrees Celsius	1	6	14	16.40	20.9
Total organic carbon	milligrams per litre	1	6	4	6.33	8
Total Phenolics	milligrams per litre	1	6	0.05	0.05	0.05
Total suspended solids	milligrams per litre	1	6	5	25.83	53

Monitoring Point 34

Stormwater monitoring point, Upstream monitoring point labelled 6 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297495 N6184504

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	1	6	59	108.83	214
Ammonia	milligrams per litre	1	6	0.01	0.02	0.04

Calcium	milligrams per litre	1	6	18	27-33	52
Chloride	milligrams per litre	1	6	26	24	51
Conductivity	microsiemens per centimetre	1	6	249	369-73	632
Dissolved Oxygen	milligrams per litre	1	6	7.7	8.21	10.2
Filterable iron	milligrams per litre	1	6	0.29	0.16	0.68
Fluoride	milligrams per litre	1	6	0.1	0.13	0.2
Magnesium	milligrams per litre	1	6	8	12-23	24
Nitrate	milligrams per litre	1	6	0.03	0.33	0.47
pH	pH	1	6	7	7.52	7.9
Potassium	milligrams per litre	1	6	3	3.87	4
Sodium	milligrams per litre	1	6	23	26.17	29
Sulfate	milligrams per litre	1	6	16	22.67	35
Temperature	degrees Celsius	1	6	13.5	16.65	21
Total organic carbon	milligrams per litre	1	6	3	5.17	7
Total Phenolics	milligrams per litre	1	6	0.05	0.05	0.05
Total suspended solids	milligrams per litre	1	6	6	15	24

B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables provided below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

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C Statement of Compliance - Licence Conditions

C1 Compliance with Licence Conditions

(☑ the boxes)

1 Were all conditions of the licence complied with (including monitoring and reporting requirements)? ☑ Yes ☐ No

(✓ a box)

2 If you answered 'No' to question 1, please supply the following details for each non -compliance in the format, or similar format , provided on the following page.

Please use a separate page for each licence condition that has not been complied with.

a) What was the specific licence condition that was not complied with?

b) What were the particulars of the non -compliance?

c) What were the date(s) when the non -compliance occurred, if applicable?

d) If relevant, what was the precise location where the non -compliance occurred?

Attach a map or diagram to the Statement to show the precise location

e) What were the registrati on numbers of any vehicles or the chassis number of any mobile plant involved in the non -compliance?

f) What was the cause of the non -compliance?

g) What action has been, or will be, taken to mitigate any adverse effects of the non -compliance?

h) What action has been, or will be, taken to prevent a recurrence of the non -compliance?

3. How many pages have you attached?

Each attached page must be initialled by the person(s) who signs Section G of this Annual Return

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C2 Details of Non-Compliance with Licence

Licence condition number not complied with
Summary of particulars of the non-compliance (**NO MORE THAN 50 WORDS**)
If required, further details on particulars of non-compliance
Date(s) when the non-compliance occurred, if applicable
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
Cause of non-compliance
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
Action taken or that will be taken to prevent a recurrence of the non-compliance

D Statement of Compliance - Load-Based Fee Calculation Worksheets

If you are not required to monitor assessable pollutants by your licence, no worksheets will appear below. Please go to Section E.

If assessable pollutants have been identified on your licence (see licence condition L2), complete the following worksheets for each assessable pollutant to determine your load-based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in the EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been sent to you with your licence. If you require additional copies you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

D1 - D8 (Not Applicable)

C2 Details of Non Compliance with Licence 5862

a)	**Licence Condition number not complied with?**
	Licence condition L2.1 was not complied with, which states: "For each monitoring /discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table" The results are discharge point 2 indicated that a Suspended Solids (SS) reading greater than the licence concentration of 50mg/L.
b)	**Summary of particulars of the non-compliance?**
	Following a rainfall event, a sample of water exiting the Whytes Gully detention pond indicated that the amount of total suspended solids was 78mg/L, this is 28mg/l more than the concentration limit provided in the sites Environmental Protection Licence (EPL).
c)	**Date(s) when the non-compliance occurred?**
	7th June 2016
d)	**If relevant, precise location where the non-compliance occurred?**
	Stormwater Monitoring and discharge point 1. (E297,777, N6,183,972)
e)	**If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?**
	N/A
f)	**Cause of the non-compliance?**
	The discharge of turbid water was caused by a heavy rainfall event in which the site was inundated with water, causing a discharge of stormwater from the sites detention pond system. The large volume of rainfall and overall turbid water witnessed throughout the entire catchment at this time indicated that the non-compliance did not have the potential to cause material harm to the environment as defined by Section 147 of the POEO Act (1997).
g)	**Action taken or that will be taken to mitigate any adverse effects of the non-compliance?**
	The water that exited the site contained suspended solids at levels above 50mg/L concentration limit prescribed in the sites EPL. Given that the entire catchment was visibly turbid and heavily laden with sediment at the time. The downstream sample taken at the same time indicated that the suspended solids were lower than the 50mg/L concentration limit, this illustrates that the discharge did not cause any material harm to the local environment.
h)	**Action taken or that will be taken to prevent a recurrence of the non-compliance?**
	A wet weather and stormwater management work instruction had been created and implemented to ensure that the sediment pond capacity is maintained between rainfall events. This work instruction was reviewed following the two breaches (June and July) and amendments made such as the purchase of a handheld turbidity monitor and pH sampling equipment. This will enable site staff to monitor and evaluate the water quality on a daily basis.

C2 Details of Non Compliance with Licence 5862

a)	**Licence Condition number not complied with?**
	Licence condition L2.1 was not complied with, which states: "For each monitoring /discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table" The results are discharge point 2 indicated that a Suspended Solids (SS) reading greater than the licence concentration of 50mg/L.
b)	**Summary of particulars of the non-compliance?**
	Following a rainfall event, a sample of water exiting the Whytes Gully detention pond indicated that the amount of total suspended solids was 88mg/L, this is 38mg/L more than the concentration limit provided in the sites Environmental Protection Licence (EPL).
c)	**Date(s) when the non-compliance occurred?**
	8th July 2016
d)	**If relevant, precise location where the non-compliance occurred?**
	Stormwater Monitoring and discharge point 1. (E297,777, N6,183,972)
e)	**If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?**
	N/A
f)	**Cause of the non-compliance?**
	The discharge of turbid water was caused by a heavy rainfall event in which the site was inundated with water, causing a discharge of stormwater from the sites detention pond system. The large volume of rainfall and overall turbid water witnessed throughout the entire catchment at this time indicated that the non-compliance did not have the potential to cause material harm to the environment as defined by Section 147 of the POEO Act (1997).
g)	**Action taken or that will be taken to mitigate any adverse effects of the non-compliance?**
	The water that exited the site contained suspended solids at levels above 50mg/L concentration limit prescribed in the sites EPL. Given that the entire catchment was visibly turbid and heavily laden with sediment at the time. The downstream sample taken at the same time indicated that the suspended solids were lower than the 50mg/L concentration limit, this illustrates that the discharge did not cause any material harm to the local environment.
h)	**Action taken or that will be taken to prevent a recurrence of the non-compliance?**
	A wet weather and stormwater management work instruction had been created and implemented to ensure that the sediment pond capacity is maintained between rainfall events. This work instruction was reviewed following the two breaches (June and July) and amendments made such as the purchase of a handheld turbidity monitor and pH sampling equipment. This will enable site staff to monitor and evaluate the water quality on a daily basis.

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?

(✓ a box) ☑Yes ☐No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Is the PIRMP available at the premises?

(✓ a box) ☑Yes ☐No

3 Is the PIRMP available in a prominent position on a publicly accessible web site?

(✓ a box) ☑Yes ☐No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address www.wollongong.nsw.gov.au/services/household/pages/wastemanagement.aspx

4 Has the PIRMP been tested in the last 12 months?

(✓ a box) ☑Yes ☐No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on 25/01/2017

5 Has the PIRMP been updated?

(✓ a box) ☑Yes ☐No

If you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on 25/01/2017

6 How many times has the PIRMP been activated in this reporting period? 1

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated:

The PIRMP was activated on 29/11/2016

The EPA's guidelines for preparation of pollution incident response management plans are available at

http://www.epa.nsw.gov.au/legislation/20120227epgreppirmp.htm

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(✓ a box) ☑ Yes ☐ No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(✓ a box) ☑ Yes ☐ No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address

The EPA's written requirements for publishing pollution monitoring data are available at http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm

Note - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data

Annual Return

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G Statement of Compliance - Environmental Management Systems and Practices

1 Do you have an environmental management system (EMS) certified to ISO 14001 or any other demonstrated equivalent system[1]? (see note below on demonstrated equivalent)

(✓ a box) ☐ Yes ☑ No

If your answer to question 1 is 'No', please proceed to question 5. If your answer to question 1 is 'Yes', please proceed to question 2.

2 When was the last check of the EMS[2] completed (see note below on check of EMS)? __ / __ / ____

3 Were there any non-conformances related to environmental issues identified in the last check of the EMS?

(✓ a box) ☐ Yes ☐ No

4 If there were non-conformances identified, were these non-conformances rectified?

(✓ a box) ☐ Yes ☐ No

If you answered 'No' to question 1, please answer questions 5 - 11. If you answered 'Yes' to question 1 please proceed to section H. Questions 5-11 relate to any documented environmental practices, procedures and systems in place. Refer to http://www.epa.nsw.gov.au/licensing/EMCP.htm for guidance on how to complete questions 5 to 11. If unsure of the answer, tick No.

5 Have you conducted an assessment of your activities and operations to identify the aspects that have a potential to cause environmental impacts and implemented operational controls to address these aspects?

(✓ a box) ☑ Yes ☐ No

6 Have you established and implemented an operational maintenance program, including preventative maintenance?

(✓ a box) ☑ Yes ☐ No

7 Do you keep records of regular inspections and maintenance of plant and equipment?

(✓ a box) ☑ Yes ☐ No

8 Do you conduct regular site audits to assess compliance with environmental legal requirements and assess conformance to the requirements of any documented environmental practices, procedures and systems in place?

(✓ a box) ☑ Yes ☐ No

9 Are the audits of documented environmental practices, procedures and systems undertaken by a third party?

(✓ a box) ☐ Yes ☑ No

10 Have you established and implemented an environmental improvement or management plan?

(✓ a box) ☑ Yes ☐ No

11 Do you train staff in environmental issues that may arise from your activities and operations and keep records of this

(✓ a box) ☑ Yes ☐ No

[1] Demonstrated equivalent refers to an environmental management system that the EPA considers is equivalent to the accountability, procedures, documentation and record keeping requirements of an ISO 14001 system. For further information go to:
http://www.epa.nsw.gov.au/resources/licensing/150402-environmental-management-systems-guidelines.pdf

[2] Undertaking a 'check of an EMS' refers to the ISO 14001 requirements that an organisation demonstrates conformity to the requirements of its EMS and to the standard, these checks require third-party certification that requirements have been met.

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

H Signature and Certification

This Annual Return may only be signed by a person(s) with legal authority to sign it as set out in the categories below. **Please tick (✓) the box** next to the category that describes how this Annual Return is being signed.

If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700.

If the licence holder is:	the Annual Return must be signed and certified by one of the following:
an individual	☐ the individual licence holder, or ☐ a person acting on behalf of the individual licence holder in accordance with a power of attorney for the individual. A copy of the power of attorney must be submitted with the Annual Return.
a company	☐ by two directors, or ☐ by a director and a company secretary, or ☐ if a proprietary company that has a sole director who is also the sole company secretary - by that director, or ☐ by a person delegated to sign a copy of the Annual Return on the company's behalf in accordance with the Corporations Act 2001. Delegation of authority must be submitted with the Annual Return, or. ☐ by affixing the common seal, in accordance with the Corporations Act 2001
a public authority other than a Council	☐ by the Chief Executive Officer of the public authority, or ☐ by a person delegated to sign on the public authority's behalf in accordance with its legislation
a local Council	☑ by the General Manager in accordance with s377 of the Local Government Act 1993 , or ☐ by affixing the seal of the Council in a manner authorised under the Local Government Act 1993.

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of $250,000 for a corporation or $120,000 for an individual.

I/We

- *declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and*
- *certify that the information in the Statement of Compliance in sections A, C, D, E, F and G and any pages attached to Section C is correct and not false or misleading in a material respect.*

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates below and specify the new dates to which this Annual Return relates below:

For the reporting period 29-May-2016 to 28-May-2017 or ___/___/___ to ___/___/___

SIGNATURE _____ SIGNATURE: _____

NAME (printed) DAVID FARMER NAME: (printed) _____

POSITION GENERAL MANAGER POSITION: _____

DATE 25 / 07 / 2017 DATE: ___/___/___

SEAL(if signing under seal)

PLEASE ENSURE THAT ALL APPROPRIATE BOXES HAVE BEEN COMPLETED AND THAT THE CHECKLIST ON PAGE 2 OF THE ANNUAL RETURN HAS BEEN COMPLETED

Wollongong Waste & Resource Recovery Park (Whytes Gully Waste Disposal Depot) *Environment Protection Licence 5862*

Annual Report
Period 29 May 2015 – 28 May 2016

Reference Z16/136023

Wollongong City Council
Locked Bag 8821
WOLLONGONG DC NSW 2500
Telephone 02 4227 7111
Facsimile 02 4227 7277
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ABBREVIATIONS

Al	Aluminium
ANZECC	Australian and New Zealand Environment Conservation Council
Ar	Arsenic
Ba	Barium
Ca	Calcium
$CaCO_3$	Calcium Carbonate
Cd	Cadmium
CH_4	Methane
Cl	Chloride
Co	Cobalt
Cr	Chromium
Cu	Copper
DC	Development Consent
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
F	Fluoride
K	Potassium
LEMP	Landfill Environmental Management Plan
Mg	Magnesium
Mn	Manganese
Na	Sodium
NH_3	Ammonia
NO_3	Nitrate
NO_2	Nitrite
ppm	Parts per Million
SO_4	Sulfate
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
WWARRP	Wollongong Waste And Resource Recovery Park (Whytes Gully)
Zn	Zinc

1 INTRODUCTION

1.1 BACKGROUND

The City of Wollongong is located 80 kilometres south of Sydney and is Australia's 9th largest city. The Wollongong City Council (Council) governance area occupies a relatively narrow coastal strip bordered by the Royal National Park to the north, the Windang Bridge and Yallah to the south, the Tasman Sea to the east and the escarpment to the west.

Council owns and operates the Wollongong Waste and Resource Recovery Park (the Site), which is located on Reddalls Road at Kembla Grange. The Site is situated south west of Wollongong's central business district on approximately 50 hectares and is comprised of Lots 50, 52 and 53 of DP 1022266 and Lot 2 of DP 240557.

Council holds an Environmental Protection Licence (EPL) number 5862, for "Waste Disposal – Application to Land" for the Site. Council currently operates in accordance with the sites Landfill Environmental Management Plan (LEMP) and in accord with the requirements of the Sites EPL and Development Consent (DC).

1.2 OBJECTIVES OF THE ANNUAL REPORT

Condition R1.8 of the EPL specifies that Council must provide an Annual Report to accompany the Annual Return for the Site. The objective of this report is to provide that review.

1.3 SITE HISTORY

Whytes Gully was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. Initially, the 'western gully' section was landfilled. The western gully is unlined by modern standards and was used from 1982 to 1993. Initially coal wash refuse was used to provide daily cover, then around 1988/89 steel furnace slag was introduced because of its stability in wet weather and Council's inability to source local clean fill in sufficient quantities. The leachate collection from the western gully is through a series of rock drains at the centre of each lift. The rock drains connect with a riser and the leachate flows from riser to riser, and then to the leachate collection well at the base of the western gully. The western gully section of the landfill has been capped with clay to varying depths between 1m and 4m.

The 'eastern gully' section development received consent in 1992/93, following extensive public consultation. The eastern gully section is lined with a single layer of HDPE smooth liner, over a subsoil drainage layer of 5mm gravel and a corrugated groundwater drainage system. The eastern gully was excavated to rock and was developed in two stages, beginning with the first stage 80 to 100m above the slope from the current toe of the landfill embankment. The leachate is drained from the first stage of the eastern gully via a 300mm corrugated drainage pipe at the base and a 300mm thick sand layer above the liner.

The second stage of the eastern gully operates in front and above the first stage, with extended leachate drains and HDPE liner. From 2014 to 2016 the eastern gully has undergone extensive surface reshaping

works in order to reduce rainwater infiltration, increase surface water diversion, ensure consistent cover depths and to prepare the surface for the new landfill cell base liner.

The new stage 3 landfill development commenced with construction below the eastern gully in August 2013, with the first cell 1A completed in 2014. Waste commenced being placed in Cell 1A in March 2015. Council has since constructed Cell 1B (2015) and commenced filling. Cell 2 is currently being designed for programed construction in 2017.

Leachate is collected from all landfilled areas at the site and treated in a 3 stage process. The leachate is initially collected in a primary holding pond that uses a biological process and aeration to strip the leachate of ammonia. The leachate is then pumped to a smaller pond with a larger surface area to increase the speed of this process on a batch by batch basis. From the smaller pond the leachate is then pumped to a sequential batch reactor that in conjunction with a filtration system eliminates the residual contaminants in the leachate suitable for acceptance by sewer under the sites Trade Wastewater Agreement with Sydney Water.

1.4 RELEVANT DOCUMENTS

This annual report refers to and / or draws upon information and data from the following documents;

- Whytes Gully Waste Disposal Facility – Annual Return for Period 29 May 2014 to 28 May 2015. By Wollongong City Council July 2015
- Whytes Gully Waste Disposal Facility – Annual Return for Period 29 May 2013 to 28 May 2014. By Wollongong City Council July 2014
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2012 to 31 May 2013. By Wollongong City Council July 2013
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2011 to 31 May 2012. By Wollongong City Council July 2012
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2010 to 31 May 2011. By Wollongong City Council July 2011.
- Whytes Gully Waste Disposal Facility – Annual Report for Period 01 June 2009 to 31 May 2010. By GHD July 2010.

2 KEY LICENCE ISSUES

2.1 ENVIRONMENTAL PROTECTION LICENCE ANNUAL RETURNS

The Environment Protection Authority (EPA) has issued an *Environmental Protection Licence* (Licence No. 5862) for the landfill and related operations on the Whytes Gully site. The licence, issued under the *Protection of the Environment Operations Act 1997,* requires an annual return and report to be submitted to the EPA, including;

a) Statement of compliance (on approved EPA form).

b) Monitoring and complaints summary (on approved EPA form).

c) Tabulated results of all monitoring data required to be collected by the licence.

d) A graphical presentation of the data for at least three years (if available).

e) Notations made regarding any statistically significant variations or anomalies.

f) An analysis and interpretation of all monitoring data.

g) An analysis of and response to any complaints received.

h) Identification of any deficiencies in environmental performance and remedial action taken or proposed to be taken.

i) Recommendations on improving the sites environmental performance.

The EPL Annual Returns for 2008 to 2015 reporting periods were reviewed to provide a background to this report. These Annual Returns can be summarised as follows:

01 June 2008 to 31 May 2009

B1. Pollution complaints - Nine
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Ten non compliances.
C2. Details of non-compliance

1. *Stormwater pH measurement > 8.5*
2. *Four missed stormwater conductivity measurements*
3. *Stormwater suspended solids > 50mg/L twice*
4. *Four missed potassium groundwater measurements*
5. *One missed groundwater redox, coliforms and dissolved oxygen measurements*
6. *Three missed groundwater alkalinity measurements*
7. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium tests*
8. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*
9. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*
10. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*

01 June 2009 to 31 May 2010

B1. Pollution complaints - Twelve

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Five non compliances.

C2. Details of non-compliance

1. *Two missed stormwater temperature measurements*
2. *Missed stormwater filterable iron measurement*
3. *One round of groundwater monitoring missed*
4. *One round of groundwater monitoring missed*
5. *One round of landfill gas monitoring missed*

01 June 2010 to 31 May 2011

B1. Pollution complaints – Twelve

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Zero non-compliance.

C2. Details of non-compliance – N/A

01 June 2011 to 31 May 2012

B1. Pollution complaints – Forty Eight

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Zero non-compliance.

C2. Details of non-compliance – N/A

01 June 2012 to 31 May 2013

B1. Pollution complaints – Fifty nine

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Zero non-compliance.

C2. Details of non-compliance – N/A

29 May 2013 to 28 May 2014

B1. Pollution complaints – forty eight

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Two penalty notices issued.

C2. Details of non-compliance – Both penalty notices issues were associated with processes that Council did not undertake in accordance with the Whytes Gully Environment Protection Licence conditions. The first penalty notice was associated with excavating into waste to dispose of large flood related debris. Any waste excavation requires EPA pre-approval. The second penalty notice was associated with a major construction contractor not complying with the defined approved odour management plan for the works undertaken. Specifically, the maximum trench distance for the installation of a gas

drainage pipe was exceeded. Both of these circumstances have been identified by the EPA as generating odour.

29 May 2014 to 28 May 2015

B1. Pollution complaints – Ten
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero
C2. Details of non-compliance – n/a

29 May 2015 to 28 May 2016 (current report)

B1. Pollution complaints – Thirty Eight
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – One
*C2. Details of non-compliance – In August 2015 during a significant rainfall event, surface water overflowed from the Whytes Gully site sediment ponds. The value of suspended solids measured 116 mg/L which is higher than that specified in the EPL of 50 mg/*L.

Other Disclosure - One Official Caution dated 21 March 2016 was received during the reporting period for failing to identify the 2013-14 issued penalty notices within the Statement of Compliance section of the 2013-14 Annual Environment Management Report

The EPL has had several variations applied to it in recent years. These changes include:

- Approval granted to dispose of waste in Cell 1B on 01 September 2015
- Approval granted to dispose of waste in Cell 1A on 28 October 2014.
- Site boundaries updated to excise the previous Solid Waste to Energy Recovery Facility from the landfill licence to allow Visy to gain their own licence for the retrofit of the building as a Materials Recovery Facility. Also addition of a Potential Offensive Odour clause and analytical unit measures amended on 08 July 2014.
- Wording amendments and consolidation of various clauses as well as monitoring point updates in 23 August 2013.
- Inclusion of further enhanced and upgraded environment sampling points on 23 August 2013 for the Stage 3 (new landfill cell development).
- Overhauled and reformatted licence resulting from Council's request to modernise environmental testing requirements and to formally recognise the increased environmental sampling points and standards adopted by Council for the site. The request formed Annexure B of the 2010/2011 Annual Environmental Management Report and was formally approved and adopted by the EPA on 16 April 2012.
- Tidy up of various incremental site changes including lot and boundary amendments, sampling point review and update including location detail, removal of redundant trial and

reporting details and various other updates in line with EPA reformatting and internal software and consistency changes 16 April 2012.

- Addition of pollution studies and reduction programs added on 28 November 2008.
- Scheduled Activity and Waste Classification structure changed on 17 October 2008.
- Reformatted licence including specification for cover material, litter control and other operational processes 20 November 2007.
- Clarification of water pollution prevention requirements on 11 October 2005.

3 REVIEW OF LANDFILL MONITORING DATA

3.1 SURFACE WATER MONITORING

Key:

Image 3.1 No.	EPL No.	Comment
1	1	Source
4	33	Downstream
6	34	Upstream

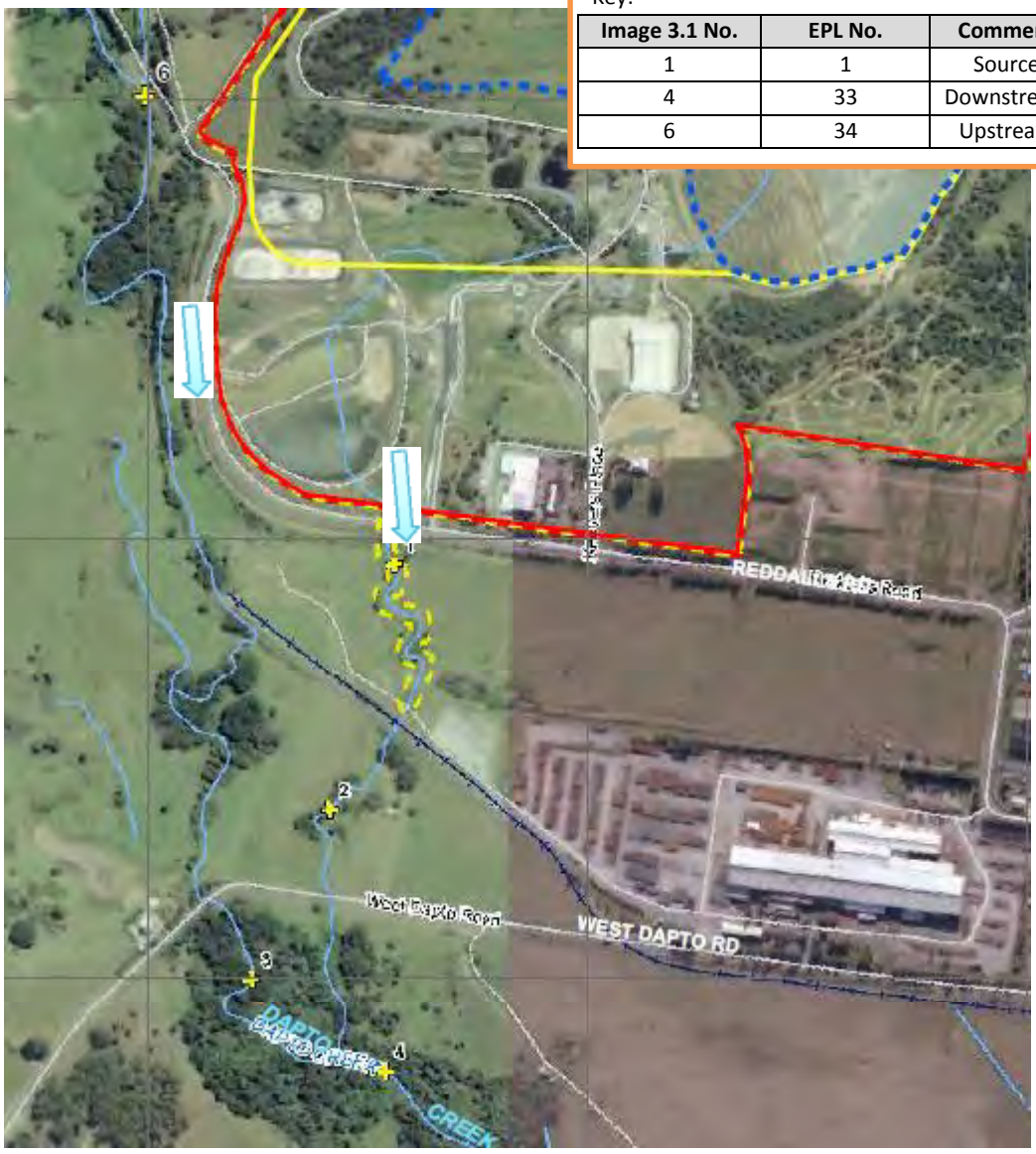


Image 3.1: Surface Water Flow Paths and EPL Sample Point Locations.

3.1.1 Tabulated Results (Annual Sample)

As per the sites EPL, a single annual sample and sampling of each stormwater overflow event was undertaken with the following results:

Table 3.1.1.1 Annual stormwater monitoring results for the reporting period

	Mar 2016	EPA Monitoring Location		
Analyte	**Units**	**1**	**33**	**34**
Alkalinity	mg/L	455	207	183
Ammonia	mg/L	0.22	<0.01	0.05
Calcium	mg/L	190	46	51
Chloride	mg/L	649	57	52
Conductivity	µS/cm	3060	652	618
Dissolved O_2	mg/L	2.99	1.45	3.7
Iron	mg/L	<0.05	0.52	0.05
Fluoride	mg/L	0.5	0.2	0.2
Magnesium	mg/L	102	22	23
Nitrate	mg/L	0.29	<0.01	0.04
Potassium	mg/L	14	4	3
Sodium	mg/L	342	53	43
Sulfate	mg/L	114	<1	31
Temperature	°C	24	26.6	25
TOC	mg/L	11	9	3
TP	mg/L	<0.05	<0.05	<0.05
TSS	mg/L	93	36	10
pH	pH	7.6	7.4	7.6

3.1.2 Tabulated Results (Discharge or Overflow Events)

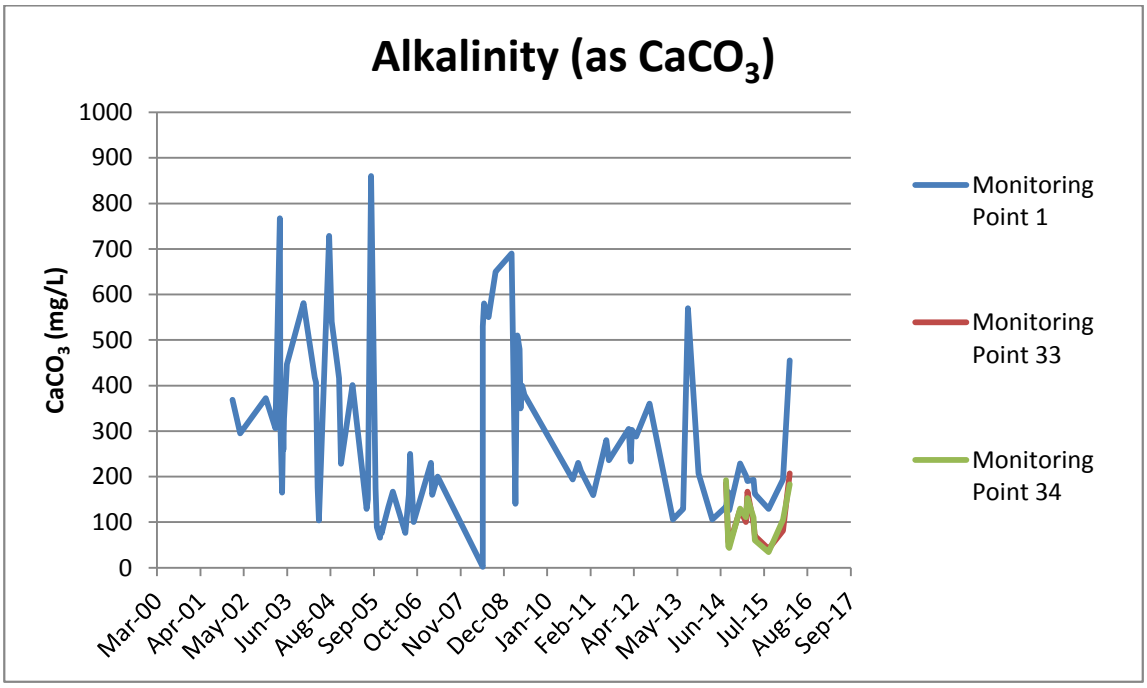
Additionally, overflow events were also sampled as per the sites EPL. With the following results:

Table 3.1.2.1 Overflow stormwater monitoring results for the reporting period

Analyte	Units	EPA Monitoring Point 1		EPA Monitoring Point 33		EPA Monitoring Point 34	
		25/8/2015	5/1/2016	25/8/2015	5/1/2016	25/8/2015	5/1/2016
Alkalinity	mg/L	129	194	41	81	34	105
Ammonia	mg/L	1.92	0.1	0.26	0.02	0.03	0.03
Calcium	mg/L	24	30	11	23	11	32
Chloride	mg/L	37	126	16	35	14	37
Conductivity	µS/cm	508	829	224	349	171	394
Dissolved O_2	mg/L	9.46	8.09	9.69	7.84	11	8.99
Iron	mg/L	0.19	<0.05	0.5	0.13	0.57	0.14
Fluoride	mg/L	0.3	0.4	0.1	0.2	0.1	0.2
Magnesium	mg/L	14	21	6	11	5	15
Nitrate	mg/L	2.62	0.44	1.33	0.33	<1.15	0.45
Potassium	mg/L	12	17	5	4	3	4
Sodium	mg/L	58	122	19	35	15	33
Sulfate	mg/L	20	32	11	28	12	30
Temperature	°C	13.7	21.2	13.3	20.3	12.6	19.2
TP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TOC	mg/L	12	16	8	5	7	6
TSS	mg/L	**116**	18	47	42	46	6
pH	pH	8.2	8	7.8	7.3	7.7	7.9

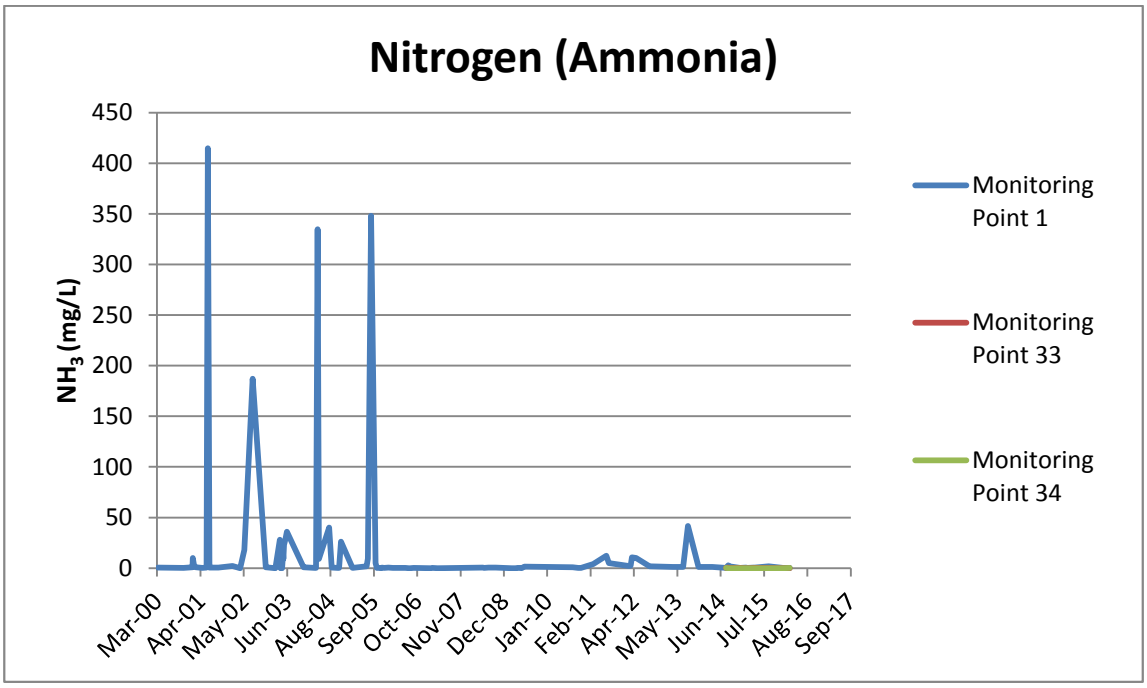
3.1.3 Data Presentation

Figure 3.1.3.1 Alkalinity results presentation



Alkalinity is a measure of waters capacity to resist changes in pH that would make the water more acidic (reduce pH). Therefore alkalinity is inextricably linked to pH values and should be further analysed if pH problems were evident. However, pH values have been maintained within the normal range for water bodies (6.5-8.5).

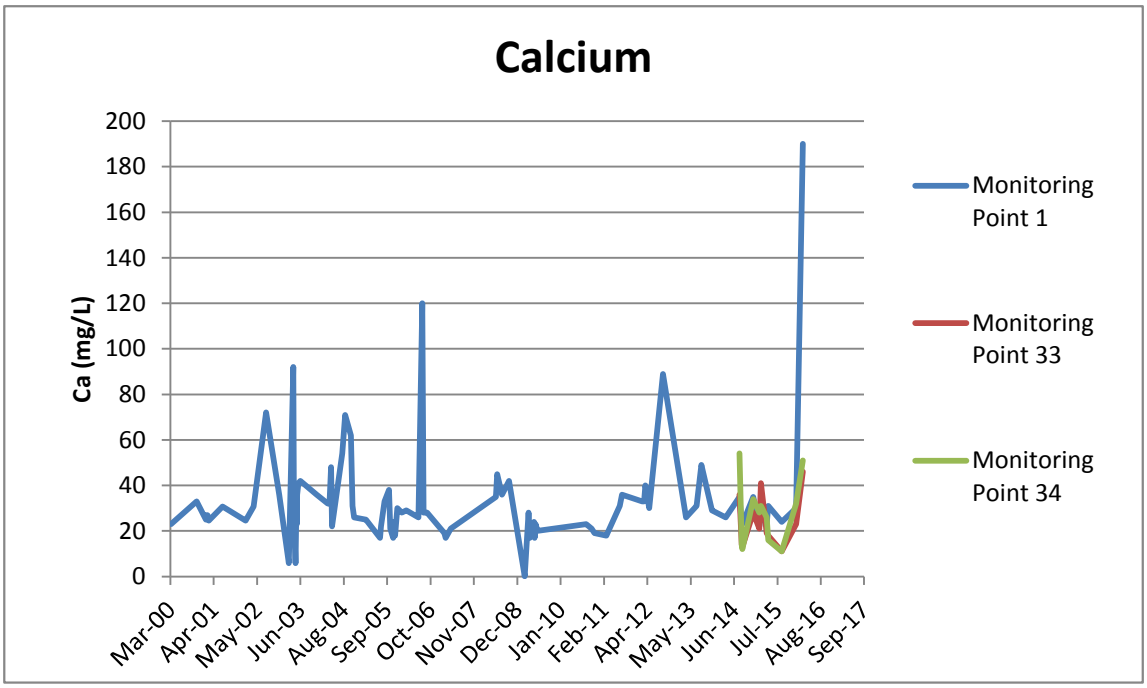
Figure 3.1.3.2 Ammonia results presentation



Ammonia is a by-product of the decomposition of organic matter. Therefore, increased ammonia levels can be a good indicator of environmental contamination sourced from landfill leachate. The

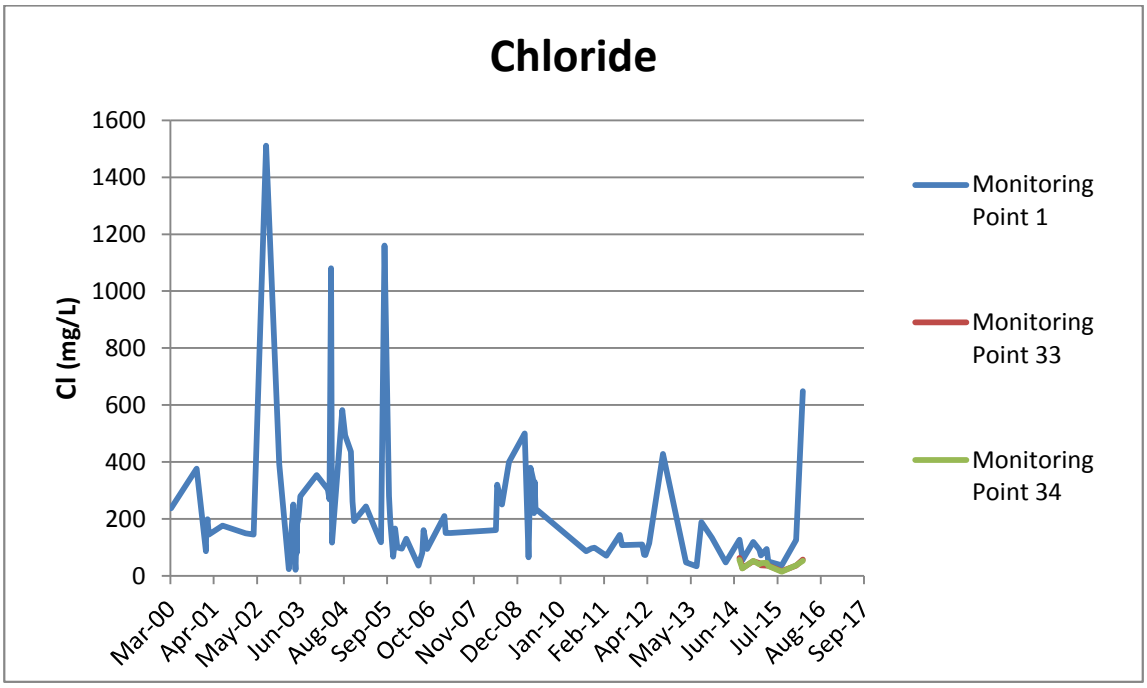
low ammonia levels indicated suggests that leachate does not appear to be infiltrating the stormwater pond.

Figure 3.1.3.3 Calcium results presentation



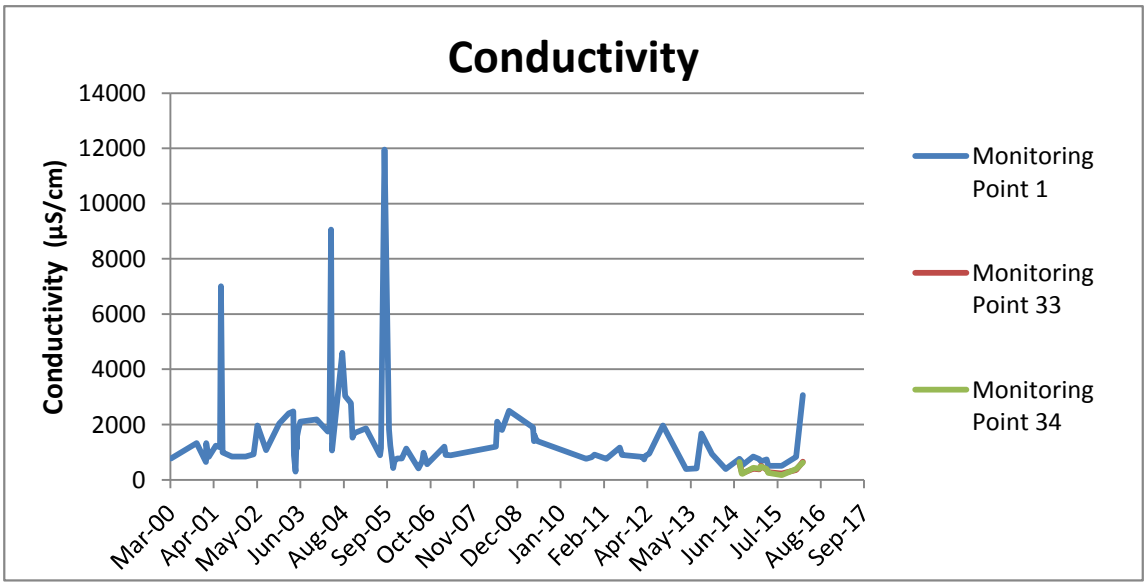
Calcium is an abundant element that is generally found in water through the erosion of rocks. However it is also common in construction materials, such as cement, brick lime and concrete. In March 2016 the annual (not an overflow event) sample resulted in an elevated result for calcium of 190 mg/L which is approximately three times the background trend. As Whytes Gully does not accept construction and demolition waste materials, there are very few anthropogenic sources of calcium into the sediment ponds. However, there has been a large amount of construction and accordingly large volumes of construction materials have been imported to the Site during the reporting period. It is most likely that the result is attributed to some of this construction material. Three follow up samples (reported in the 2016-17 reporting period) have been taken and each indicates that calcium levels in the sediment pond have since returned to historic levels.

Figure 3.1.3.4 Chloride results presentation



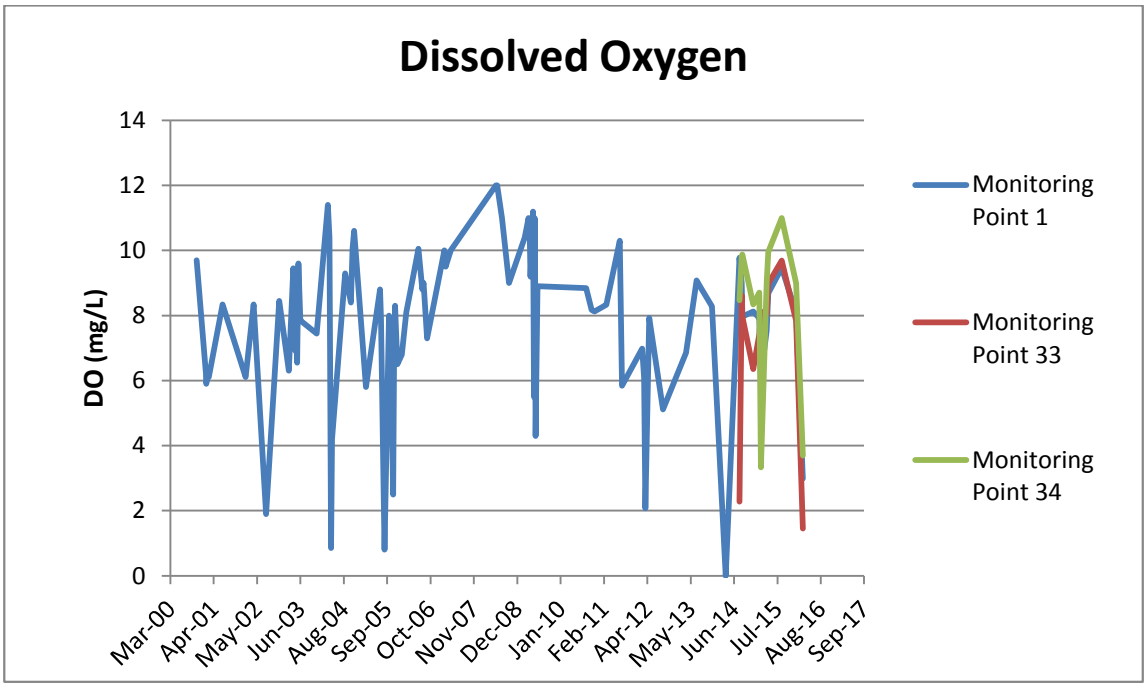
Chloride is present in landfill leachate and is therefore considered to be an indicator of uncontrolled leachate release. The chloride levels in the stormwater pond are consistent with historical results.

Figure 3.1.3.5 Conductivity results presentation



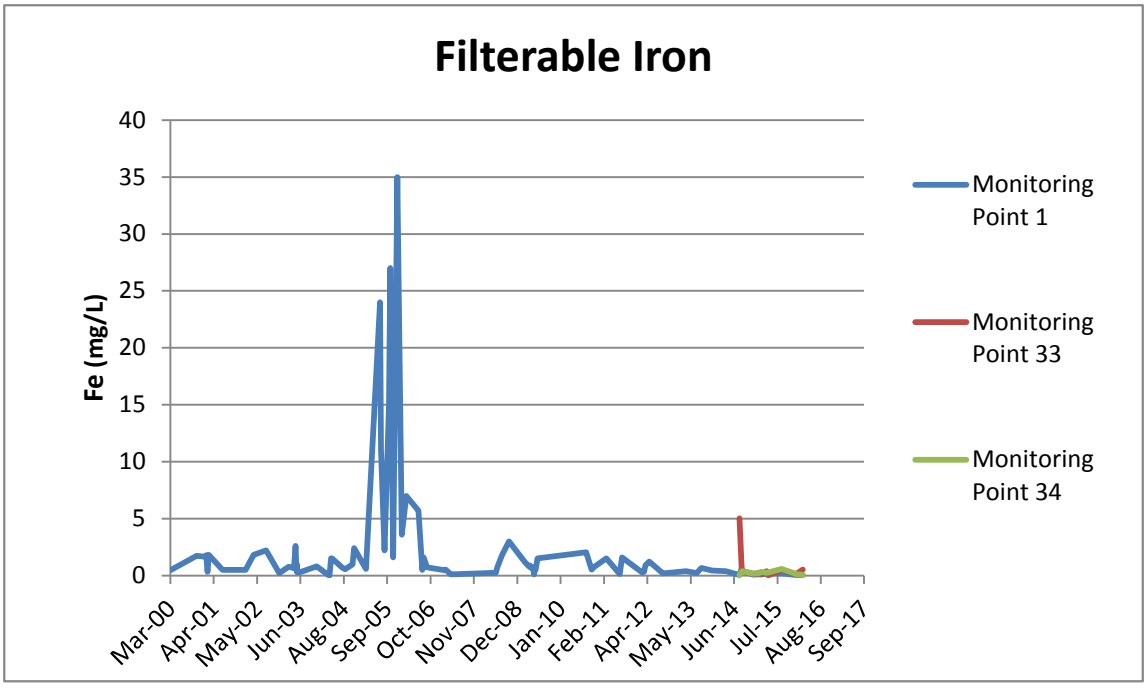
Conductivity is a measure of the waters ability to pass electrical current, usually though positively or negatively charged inorganic dissolved solids. It therefore indirectly measures the presence of inorganic materials including calcium, bicarbonate, nitrogen, phosphorus, iron, sulphur and other ions dissolved in a water body. Low levels of inorganic materials have been found in the sediment pond during the reporting period. The 3,060 µS/cm result corresponds with the solitary calcium result discussed underneath Table 3.1.3.3.

Figure 3.1.3.6 Dissolved oxygen results presentation



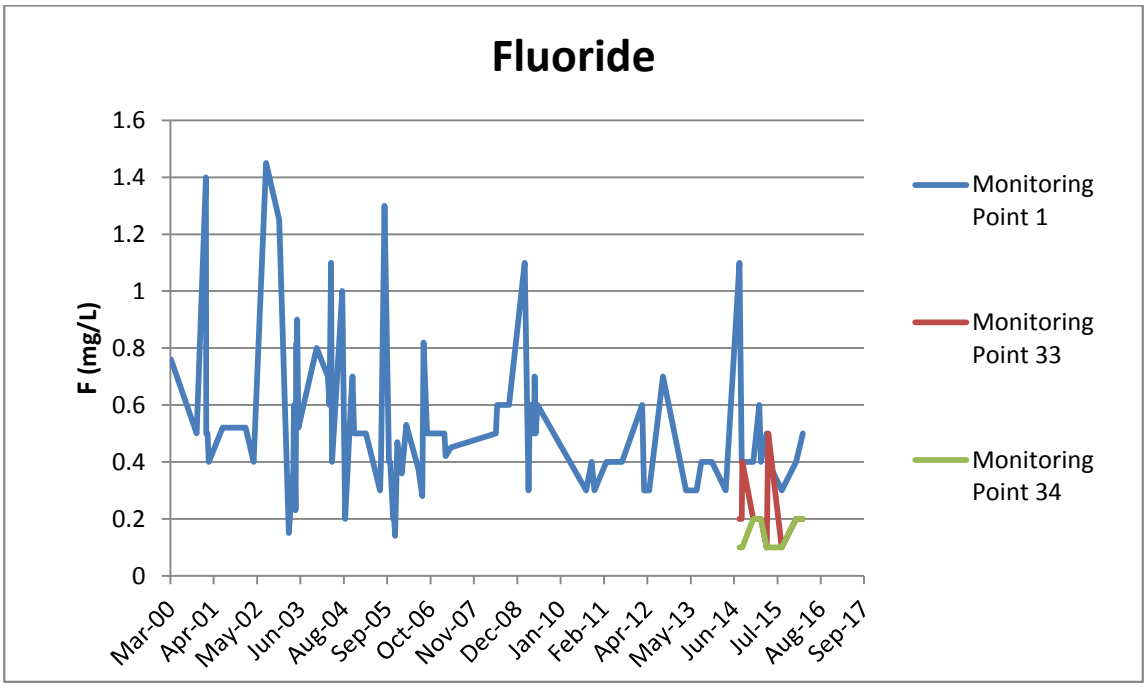
Dissolved oxygen levels can be depleted by biological activity associated with the nitrification process common in landfill leachate. Dissolved oxygen levels have historically fluctuated in the sediment pond. More recent sampling of upstream and downstream locations indicate that the fluctuations experienced over the reporting period are typical of the water body and not impacted by the sediment ponds at the Site.

Figure 3.1.3.7 Filterable iron results presentation



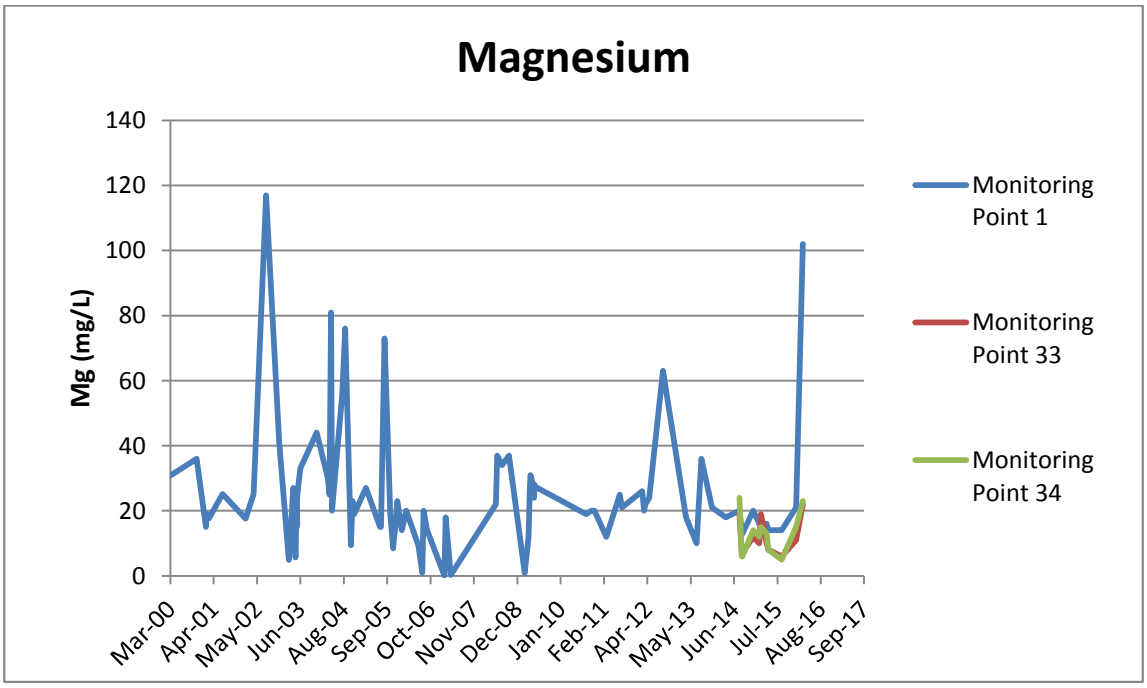
Filterable iron has continued to trend at very low levels, especially with regard to the reporting period.

Figure 3.1.3.8 Fluoride results presentation



Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L. The level of fluoride found in the stormwater detention pond is therefore by comparison relatively low and displays a consistent trend over the twelve year sampling period. Fluctuations evident are very low actual levels, up to 0.6 mg/L.

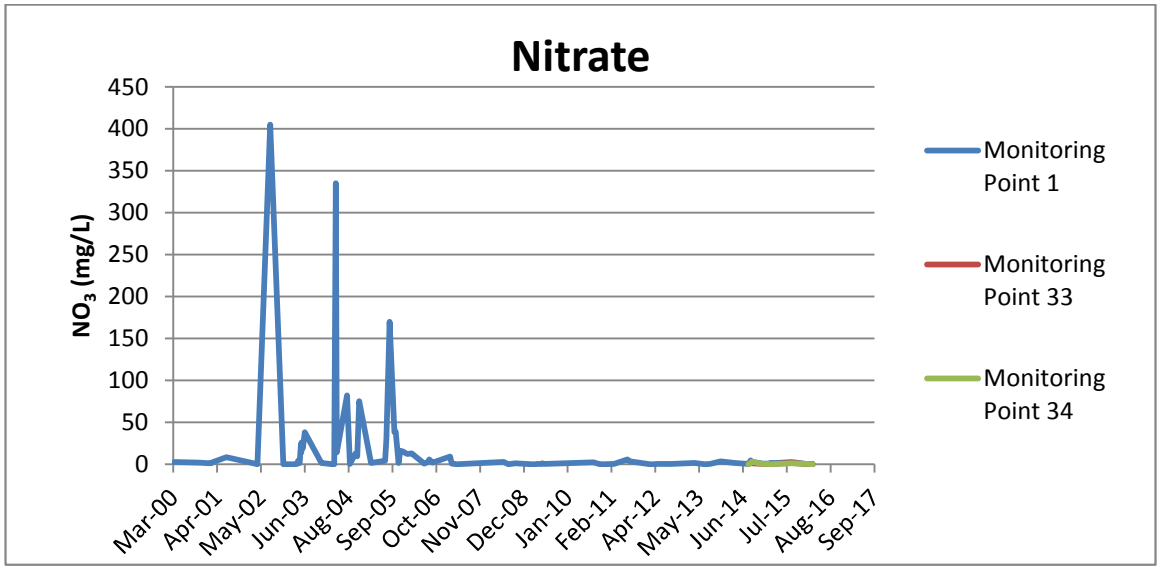
Figure 3.1.3.9 Magnesium results presentation



There has been a substantial spike in Magnesium which is similarly linked with the spike in Calcium (another inorganic dissolved solid common in building and construction materials). This spike was likely contributed to by the large amount of construction and accordingly large volumes of construction materials have been imported to the Site during the reporting period. Three follow up

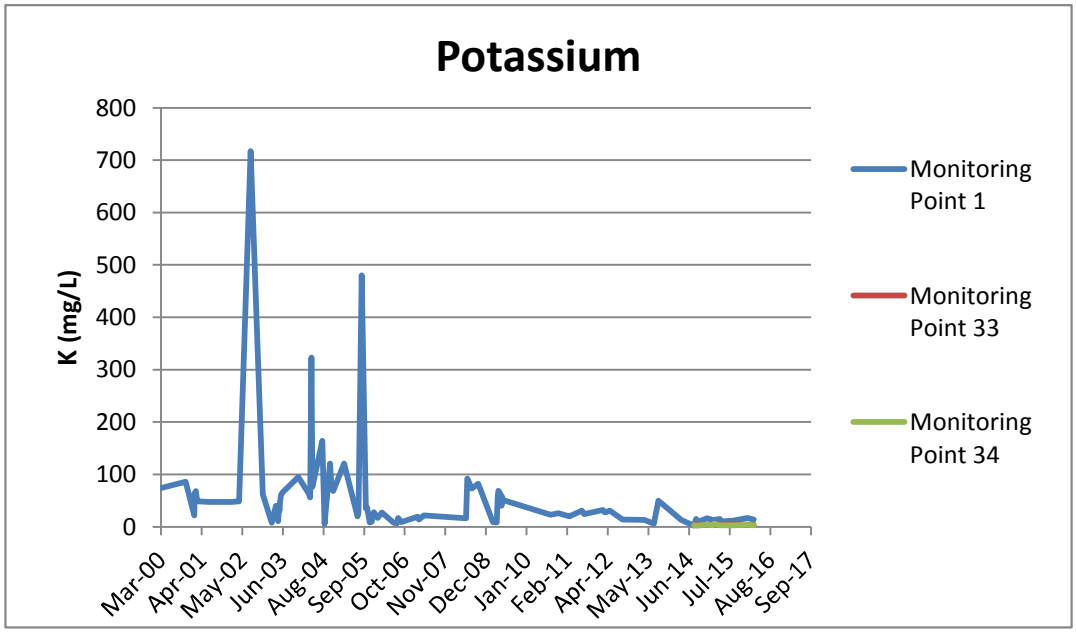
samples (to be reported in the 2016-17 reporting period) have been taken and each indicates that calcium levels in the sediment pond have since returned to historic levels. Note that the 102mg/L result was a scheduled annual sample, not an overflow sample.

Figure 3.1.3.10 Nitrate results presentation



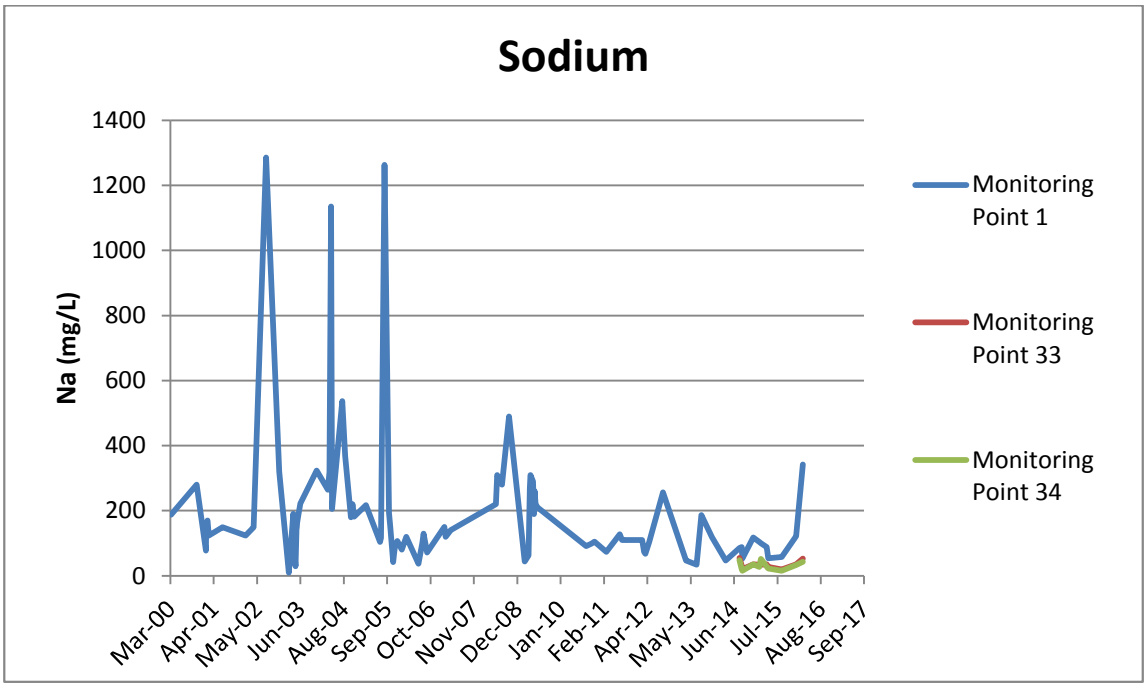
Nitrate and nitrite are naturally occurring ions that are part of the nitrogen cycle that includes the decomposition of organic matter, such as what takes place in landfills. The World Health Organisation suggests that nitrate concentration in surface water is normally between up to 18 mg/L. The samples analysed during the reporting period indicate that landfill leachate is unlikely to be intersecting with the sediment ponds.

Figure 3.1.3.11 Potassium results presentation



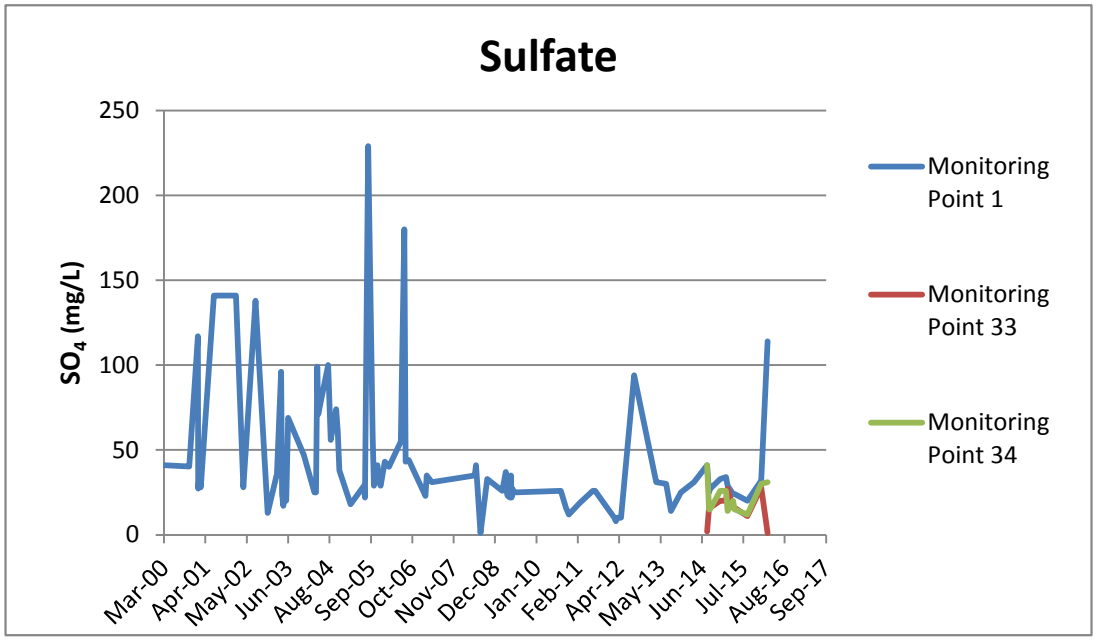
Potassium concentrations have been in line with recent trends and with the naturally occurring groundwater levels of these analytes around the site. Elevated potassium concentrations are typically associated with weathering of rocks.

Figure 3.1.3.12 Sodium results presentation



Sodium is common in water bodies due to its high solubility and abundance in rocks and soils. Sodium can provide a potential indicator of groundwater contamination by landfill leachate. Sodium has displayed a relatively high result of 342 mg/L in the scheduled annual sample round of testing. Three follow up samples (to be reported in the 2016-17 reporting period) have been taken and each indicates that sodium levels in the sediment pond have since returned to historic levels.

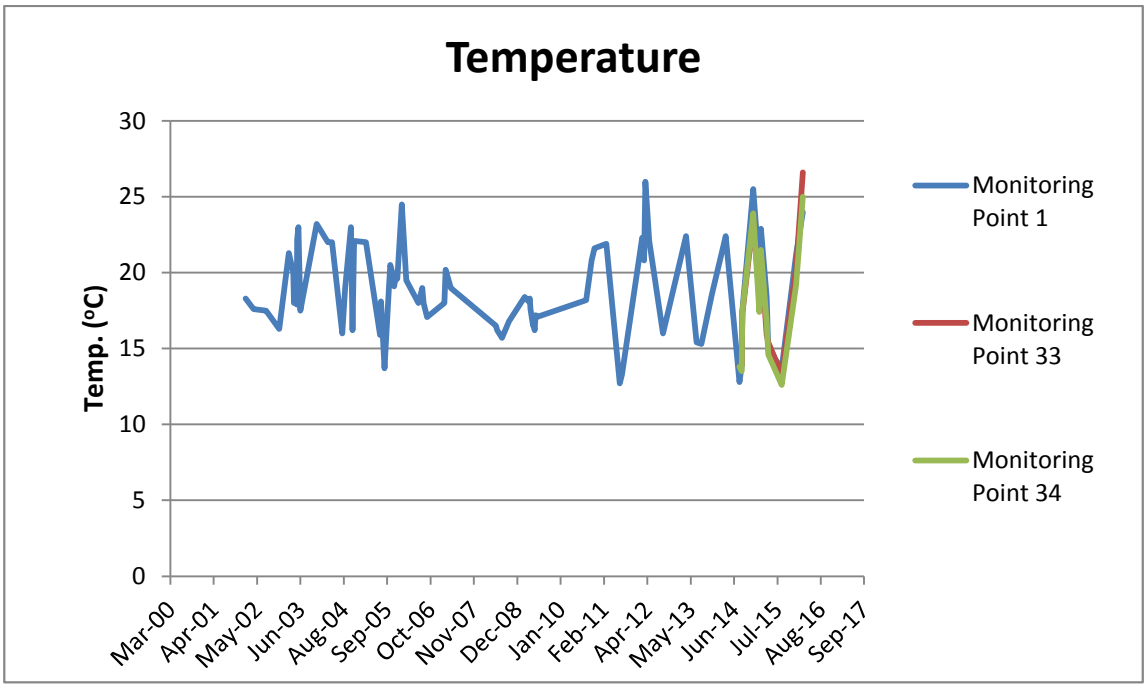
Figure 3.1.3.13 Sulfate results presentation



The *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500 mg/L. The sulfate levels in the stormwater detention pond are in line with the historical levels and are better than the drinkable water standard. Inorganic ions such as sulfate provide a potential indicator of groundwater contamination by landfill leachate. A sudden increase in these ions can

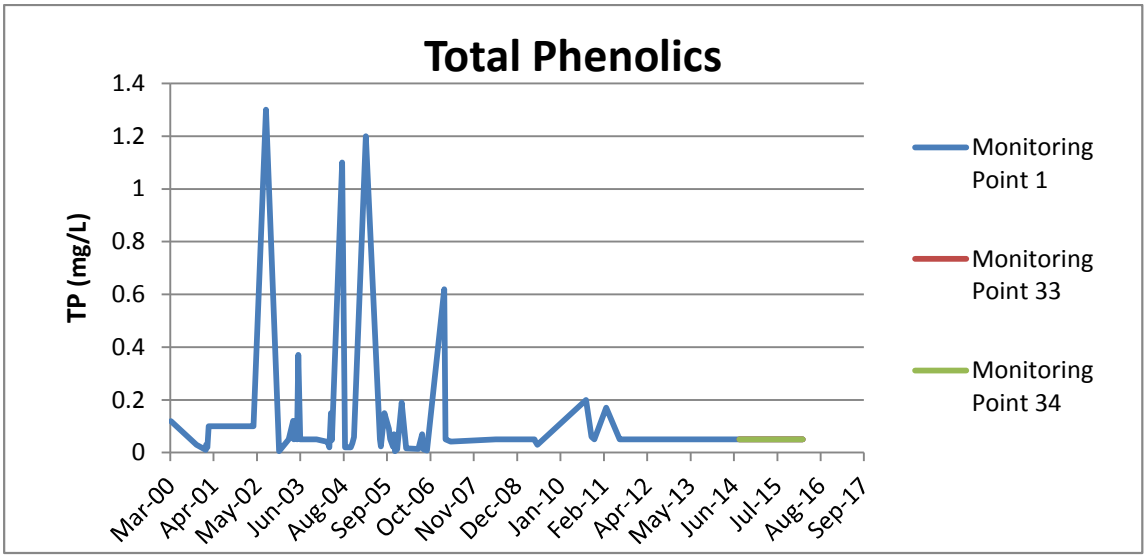
act as early warning system. The 114 mg/L result from the annual round of sampling was the highest resultsince 2006. Three follow up samples (to be reported in the 2016-17 reporting period) have been taken and each indicates that sulfate levels in the sediment pond have since returned to historic levels.

Figure 3.1.3.14 Temperature results presentation



Temperature, as expected has generally been indicative of the season in which the stormwater detention pond has been sampled and mirrors the external environment results upstream and downstream.

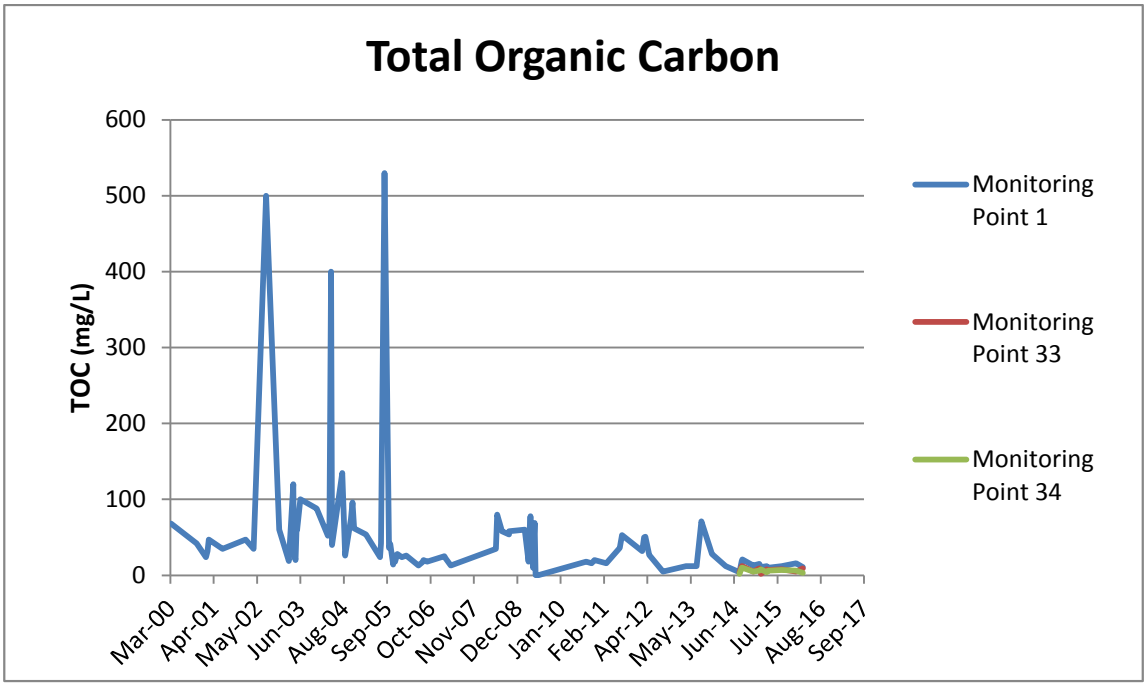
Figure 3.1.3.15 Total phenolics results presentation



Total phenols are widely used in the manufacture of resins, plastics, insecticides, explosives, dyes, and detergents. It is also used as a raw material for the production of medicinal drugs such as aspirin. Recent trend results for total phenols have been extremely low and more often than not,

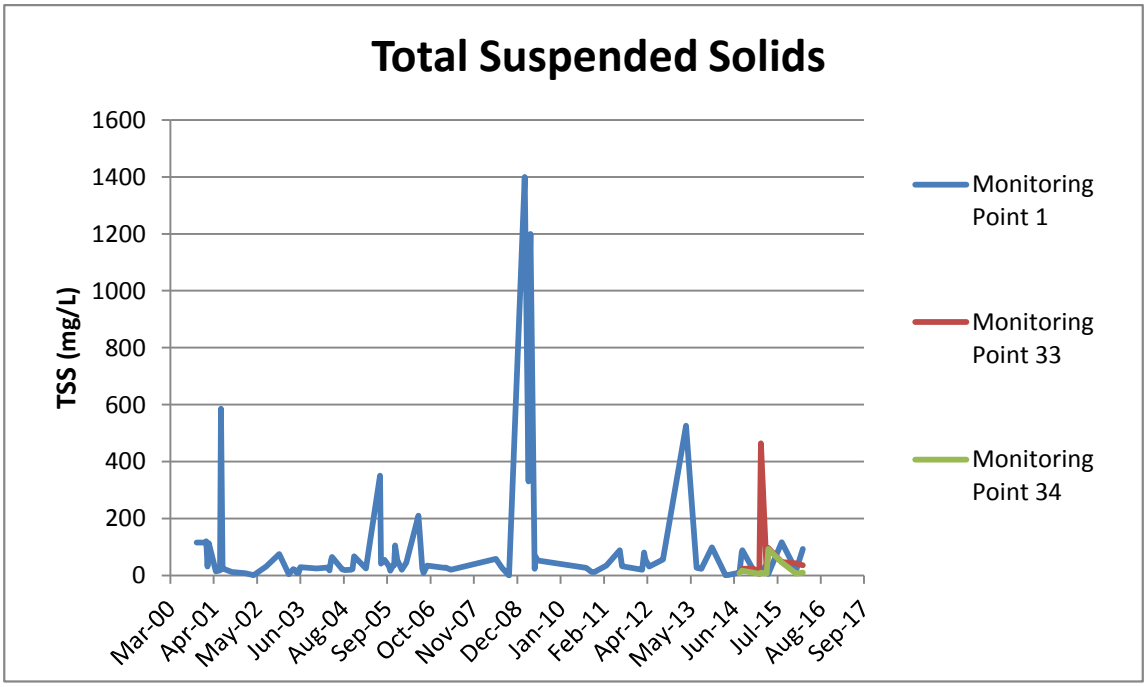
below detectable limits in the stormwater detention pond. In fact, all samples taken during the reporting period were below detectable limits.

Figure 3.1.3.16 Total organic carbon results presentation



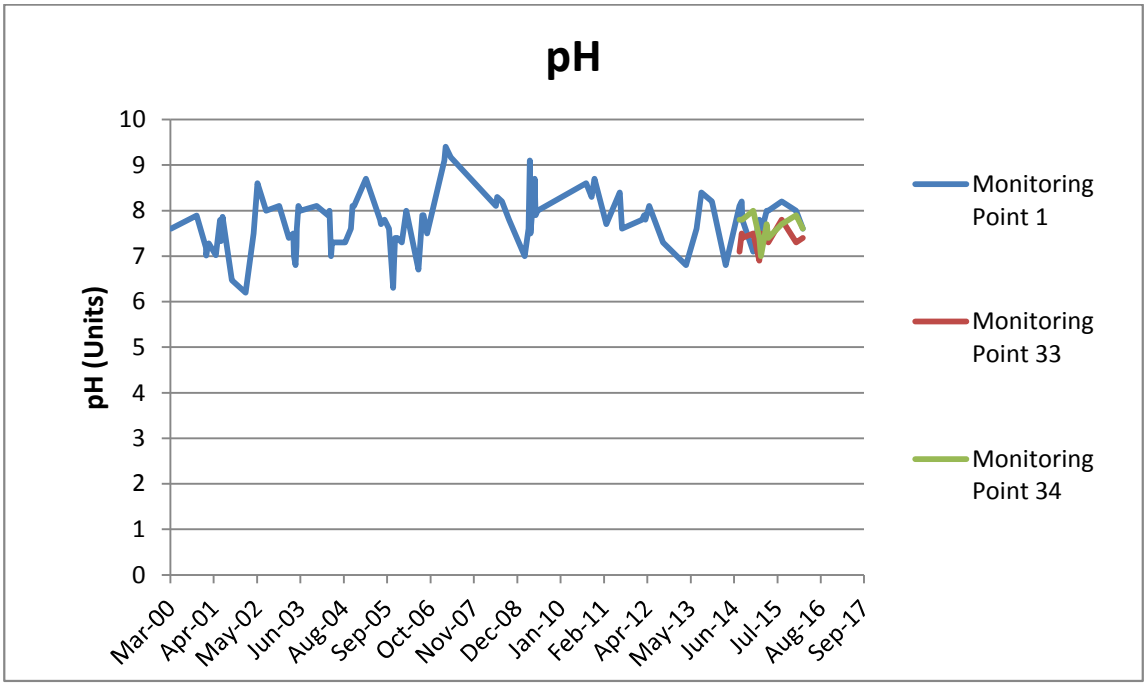
Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of water contamination by natural compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained consistently stable over the last ten years and at very low levels during the reporting period.

Figure 3.1.3.17 Total suspended solids results presentation



Samples for Total Suspended solids indicate that during the reporting period indicate that there has been a single non-compliance on 25 August 2015 with a result of 116 mg/L. A full summary of this event can be found in Section 4.1 Deficiency Identification and Remediation.

Figure 3.1.3.18 pH results presentation



Samples during the reporting period for pH show that the values have between the normal ranges of 6.5 – 8.5.

3.1.4 Surface Water Results Interpretation

Whilst the majority of analytical samples taken during the reporting period indicate low contamination levels in the sediment ponds, there has been a non-compliance with Environment Protection Licence requirements associated with higher than acceptable suspended solids exiting the site during a heavy rainfall event. Whilst not a chemical or biological contamination issue, the result shows that the sediment ponds need additional care and maintenance moving forward. Section 4.1 Deficiency Identification and Remediation further explains the improvements to be implemented as a result of the non-compliance.

Additionally, the March 2016 Annual Sample of the sediment pond displayed elevated calcium, chloride, magnesium and sulfate levels compared to the historic trends. The potential cause and rectification is discussed further in Section 4.1 Deficiency Identification and Remediation.

3.2 GROUNDWATER MONITORING

Site investigations resulting from Council's Environment Application lodged with the State Government on 01 April 2012, have confirmed a predominant approximate south-southwest groundwater flow direction. The groundwater flow direction should be used to contextualise monitoring well locations and any elevated results, please refer to the sites Environmental Monitoring Locations located in Annexure A of this document.

3.2.1 Tabulated Results

Table 3.1.1.1 Quarterly analyte testing results for 21 August 2015 *Note: Well destroyed

Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	1130	752	377	458	302	445	230	50	Dry	528	513	258	643	489	248	777
Calcium	mg/L	*	340	383	107	93	73	249	33	7	Dry	76	136	63	202	110	96	137
Chloride	mg/L	*	911	996	464	470	16	395	31	28	Dry	311	528	163	630	422	326	850
Conductivity	µS/cm	*	5190	5160	2780	2880	606	2390	507	260	Dry	1750	3080	1220	3960	2680	1670	4870
Magnesium	mg/L	*	187	191	67	81	22	85	21	4	Dry	63	97	38	144	83	51	140
Nitrogen	mg/L	*	0.01	0.03	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	Dry	0.01	0.01	0.66	<0.01	<0.01	0.01	0.06
Potassium	mg/L	*	3	2	<1	<1	<1	<1	<1	<1	Dry	1	<1	2	2	1	2	<1
Sodium	mg/L	*	661	512	443	474	36	198	78	40	Dry	385	471	159	463	372	205	877
Water Level	m	*	4.85	0.5	1.72	2.24	10.98	7.69	7.28	10.85	Dry	2.64	2.13	3.27	4.07	6.2	2.92	1.52
Sulfate	mg/L	*	188	221	178	215	18	144	34	14	Dry	116	214	95	306	148	26	313
TDS	mg/L	*	3310	3450	1610	1680	377	1610	297	191	Dry	1280	1810	716	2450	1560	991	2940
TOC	mg/L	*	<1	<1	<1	<1	<1	<1	<1	<1	Dry	4	<1	4	4	<1	<1	<1
pH	pH	*	6.7	7.2	6.7	7.1	7	7	7.2	5.8	Dry	7	6.8	6.2	6.7	7	7.3	6.8

Table 3.1.1.2 Quarterly analyte testing results for 16 November 2015 *Note: Well destroyed

Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	998	639	327	393	261	376	343	37	Dry	347	457	226	564	435	219	702
Calcium	mg/L	*	294	327	96	80	62	198	42	6	Dry	26	118	60	183	92	84	118
Chloride	mg/L	*	1050	1180	563	586	18	446	56	35	Dry	47	612	182	786	511	396	971
Conductivity	µS/cm	*	5390	5370	2830	3080	526	2330	852	233	Dry	787	3200	1080	4100	2640	1740	4990
Magnesium	mg/L	*	196	211	60	70	19	72	28	3	Dry	13	86	35	148	76	47	127
Nitrogen	mg/L	*	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	Dry	0.05	0.01	0.66	<0.01	0.02	<0.01	0.06
Potassium	mg/L	*	3	2	1	<1	<1	<1	<1	<1	Dry	2	<1	2	1	<1	1	<1
Sodium	mg/L	*	623	497	405	444	30	188	127	38	Dry	160	417	151	451	349	192	796
Water Level	m	*	4.9	0.37	1.65	2.15	11.6	7.49	7.61	11	Dry	2.5	2	3.13	3.99	6.24	2.74	1.36
Sulfate	mg/L	*	175	216	177	231	20	122	48	15	Dry	23	197	93	318	122	28	310
TDS	mg/L	*	3490	4140	1490	1680	690	1680	605	152	Dry	512	1850	657	2640	1540	1140	2890
TOC	mg/L	*	5	4	1	2	3	2	2	2	Dry	10	2	2	2	<1	1	5
pH	pH	*	6.8	6.7	6.9	7	7.2	7	7.4	6	Dry	6.9	7	6.3	6.8	7.1	7.2	6.9

Table 3.1.1.3 Quarterly analyte testing results for 5 February 2016 *Note: Well destroyed

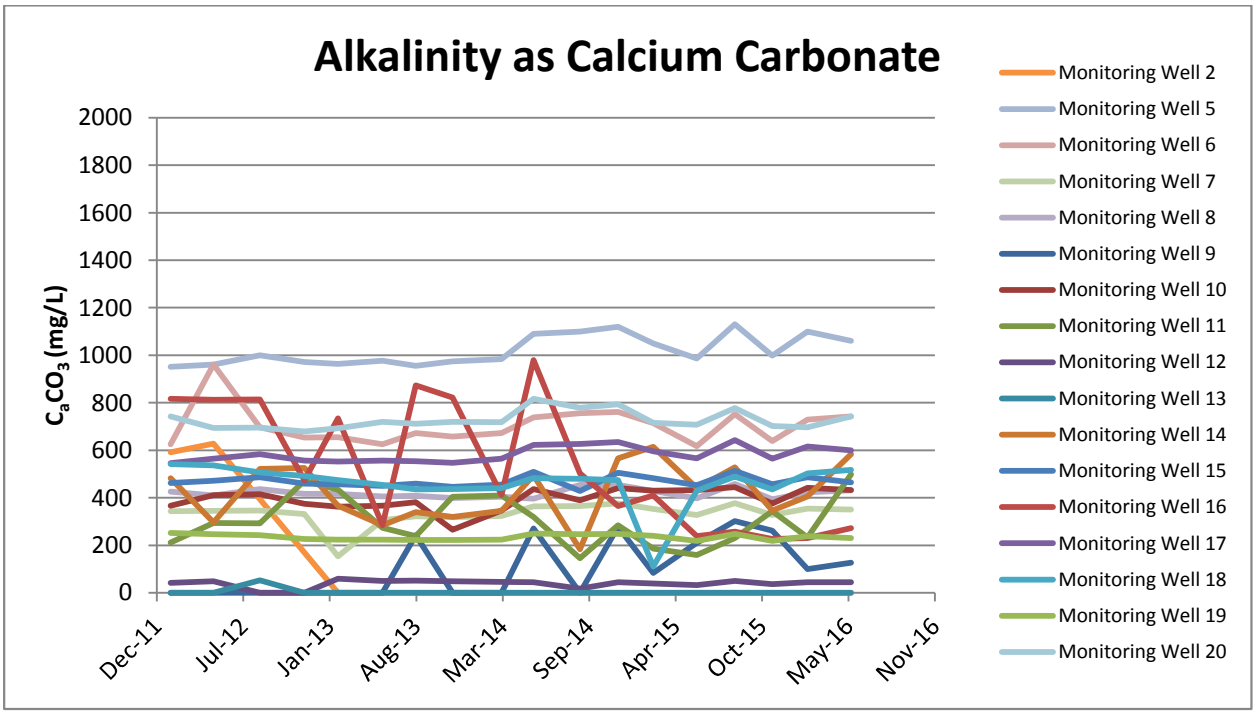
Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	1100	729	355	423	100	442	233	44	Dry	406	486	230	616	502	238	697
Calcium	mg/L	*	302	376	107	89	21	184	36	5	Dry	48	124	64	198	110	91	120
Chloride	mg/L	*	1060	1180	586	590	15	378	42	18	Dry	38	637	240	815	543	414	953
Conductivity	µS/cm	*	5550	5540	2820	3040	288	2330	944	220	Dry	864	3200	1310	4160	2550	1740	4160
Magnesium	mg/L	*	188	214	62	78	7	64	23	2	Dry	21	87	39	151	86	47	121
Nitrogen	mg/L	*	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Dry	0.04	<0.01	0.66	<0.01	<0.01	<0.01	0.07
Potassium	mg/L	*	3	2	<1	<1	<1	<1	<1	<1	Dry	4	1	2	2	1	1	<1
Sodium	mg/L	*	575	500	408	459	21	173	81	30	Dry	124	403	152	451	373	180	728
Water Level	m	*	4.89	0.38	1.64	2.2	2.0	7.4	7.43	10.5	Dry	2.44	1.95	2.97	3.98	6.27	2.74	1.24
Sulfate	mg/L	*	168	194	164	210	11	120	38	16	Dry	19	192	74	303	140	26	276
TDS	mg/L	*	3880	1730	1810	222	1480	408	341	563	Dry	563	1950	728	2650	1760	1090	2880
TOC	mg/L	*	5	4	<1	2	2	<1	1	2	Dry	9	2	7	<1	2	<1	3
pH	pH	*	6.6	6.9	6.8	7.2	6.6	7	7.4	5.9	Dry	7	7	6.4	6.9	7	7.2	7

Table 3.1.1.4 Quarterly analyte testing results for 16 May 2016 *Note: Well destroyed

Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	1060	742	351	431	127	433	499	44	Dry	583	485	272	600	517	231	743
Calcium	mg/L	*	290	354	90	75	67	196	56	8	Dry	137	113	72	180	122	89	119
Chloride	mg/L	*	1080	1240	563	568	20	443	101	17	Dry	676	610	265	818	627	401	968
Conductivity	µS/cm	*	5320	5420	2780	2960	699	2240	1340	268	Dry	3720	3060	2280	4080	3300	1760	5040
Magnesium	mg/L	*	185	208	56	73	24	68	36	4	Dry	108	83	39	146	98	46	127
Nitrogen	mg/L	*	0.08	0.01	<0.01	0.01	<0.01	0.04	<0.01	<0.01	Dry	<0.01	0.02	0.77	<0.01	<0.01	0.01	0.12
Potassium	mg/L	*	2	1	<1	<1	<1	<1	<1	<1	Dry	<1	1	2	<1	<1	1	<1
Sodium	mg/L	*	639	533	433	506	36	194	199	34	Dry	484	444	174	476	455	200	843
Water Level	m	*	5.09	0.69	1.86	2.4	12.2	7.68	7.93	11.5	Dry	2.82	2.28	3.5	4.28	6.39	3.11	1.54
Sulfate	mg/L	*	166	196	153	197	17	126	65	12	Dry	211	179	56	292	205	23	251
TDS	mg/L	*	3450	3650	1560	1710	524	1550	748	192	Dry	2060	1810	812	2540	1930	1010	2900
TOC	mg/L	*	9	4	1	1	2	1	1	1	Dry	2	3	4	2	<1	<1	9
pH	pH	*	6.6	6.6	6.8	6.9	7.1	1	7.2	6.1	Dry	6.8	7.1	6.2	6.7	6.8	7	6.6

3.2.2 Data Presentation – Quarterly Monitoring

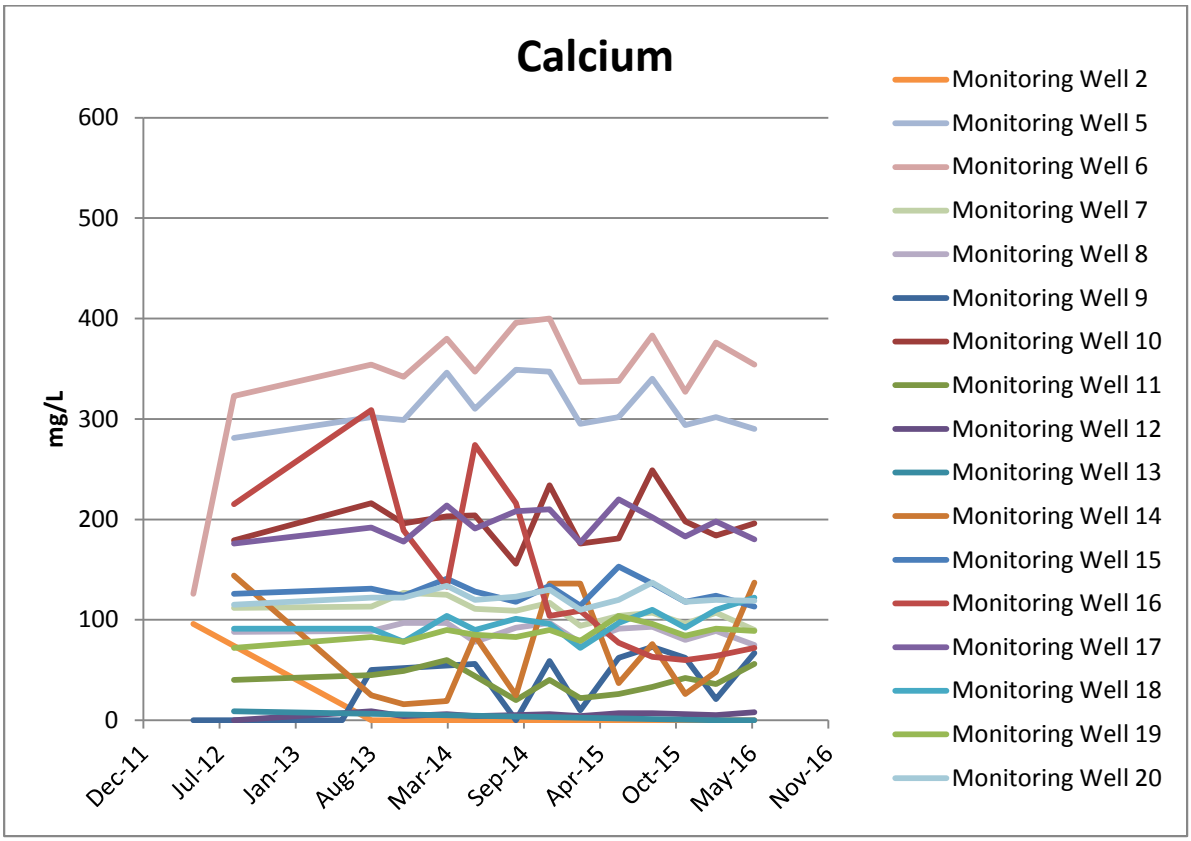
Figure 3.2.2.1 Alkalinity results presentation



Increased alkalinity levels can be caused by many chemical processes including the denitrification process common in landfill leachate. Denitrification is the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. This process produces calcium carbonate as a by-product. The stability of the calcium carbonate in the groundwater monitoring wells over the sample period shows that it is unlikely that the denitrification process caused by leachate ingress is taking place in the groundwater around the site. Nonetheless, the calcium carbonate levels are relatively high and quite "hard" in plumbing terms and continued monitoring is necessary to scrutinise for any increased value trends. It should be noted that many natural groundwater sources often contain much higher alkalinity levels than this site.

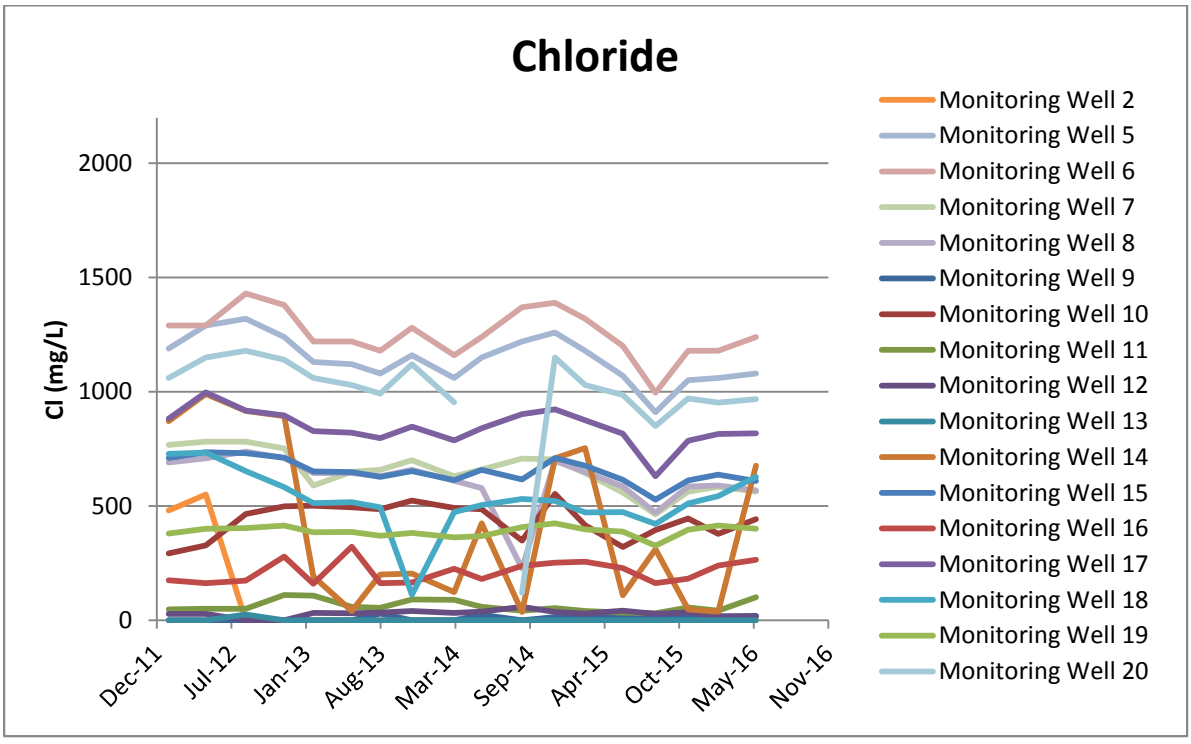
Monitoring well 16 has demonstrated the most significant fluctuations. However, the trend is overall indicating a reduction in alkalinity which is a positive result.

Figure 3.2.2.2 Calcium results presentation



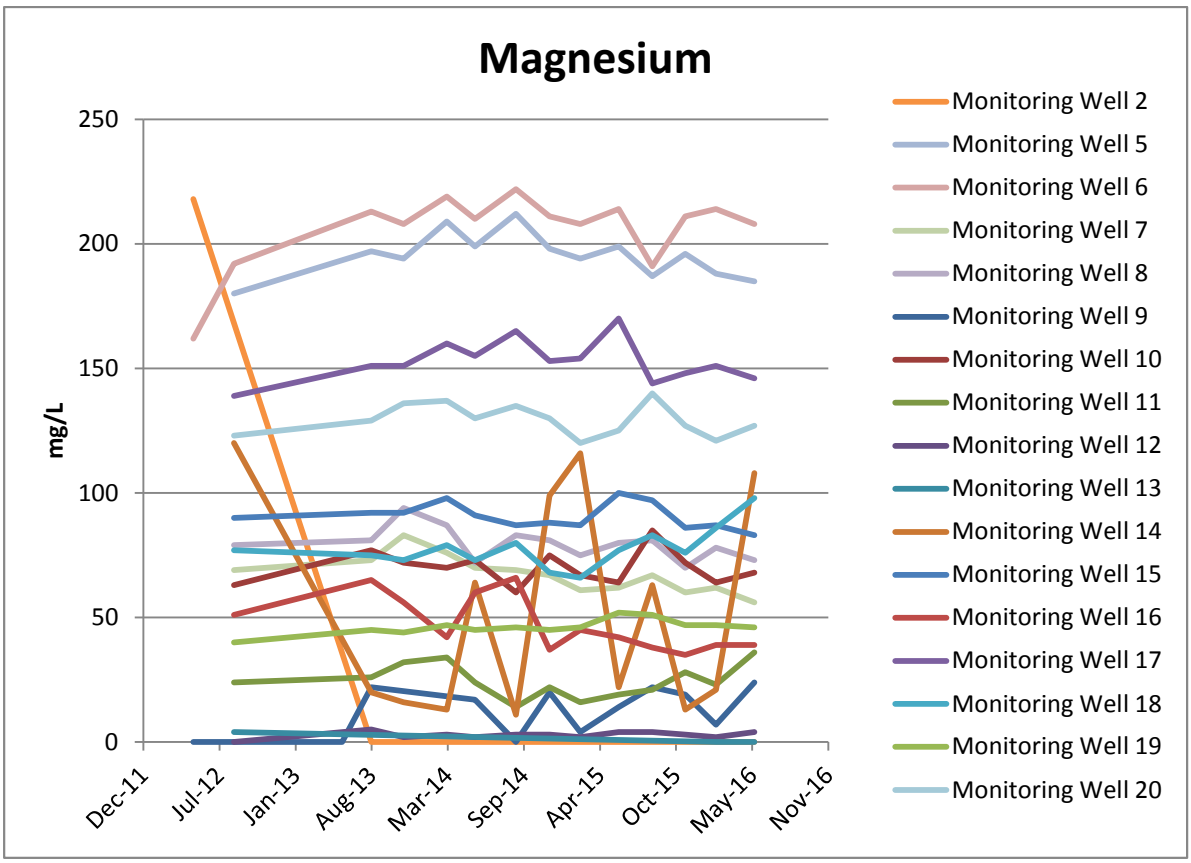
The groundwater monitoring wells show a consistent trend for calcium levels. The calcium levels sampled would be considered “hard” water in the region of 120-180mg/L. This is consistent with the presented results for alkalinity.

Figure 3.2.2.3 Chloride results presentation



The trends realised through chloride monitoring have been in line with the historical levels over the data range available. Large quantities of inorganic ions such as chloride can be an indicator of leachate contamination of groundwater. A sudden increase in these ions can act as early warning system. The sampling history for chloride suggests that no significant spikes have occurred that are not within historical fluctuation levels and therefore leachate is not indicated in the groundwater network.

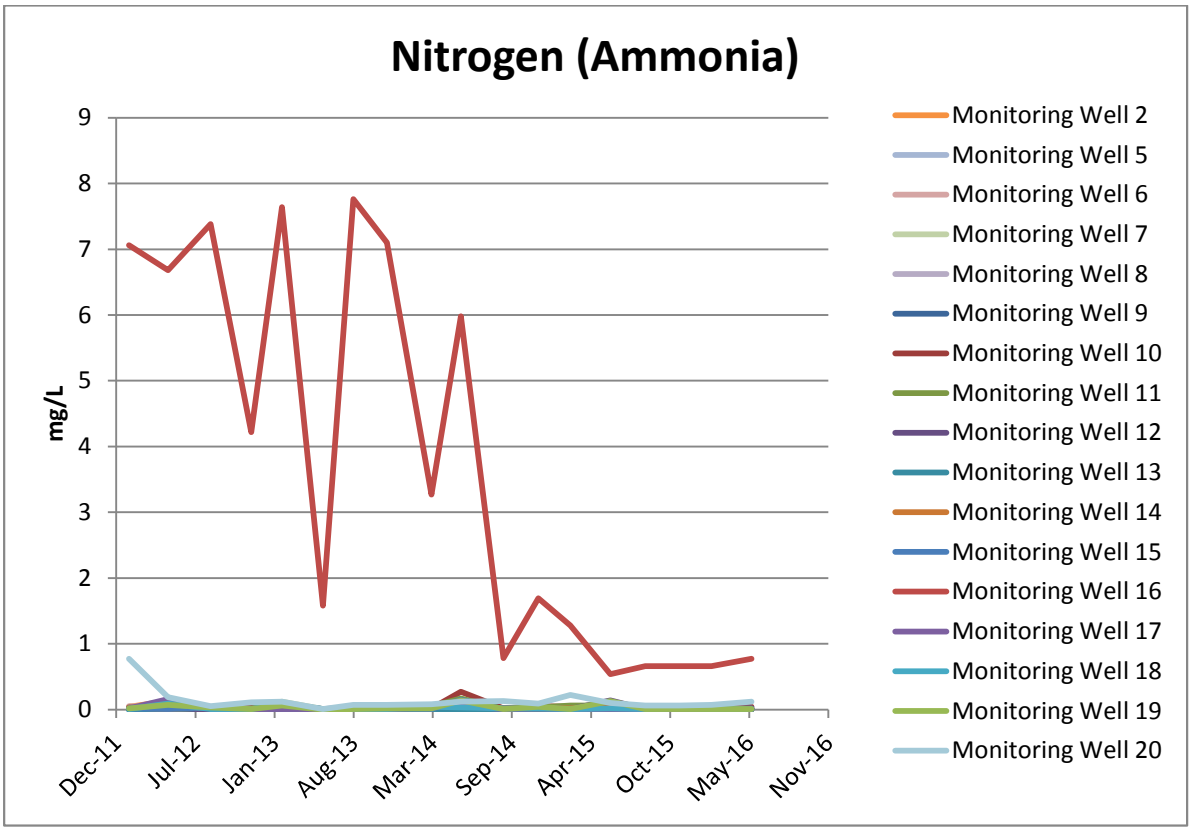
Figure 3.2.2.4 Magnesium results presentation



Monitoring well results are in line with historical levels and have maintained consistent levels. The magnesium levels sampled would be considered quite “hard” and consistent with other typical water hardness measures such as alkalinity and calcium.

Monitoring well 14 has demonstrated the must instability over the five year sampling period. However, all other wells appear relatively stable.

Figure 3.2.2.5 Nitrogen as ammonia results presentation

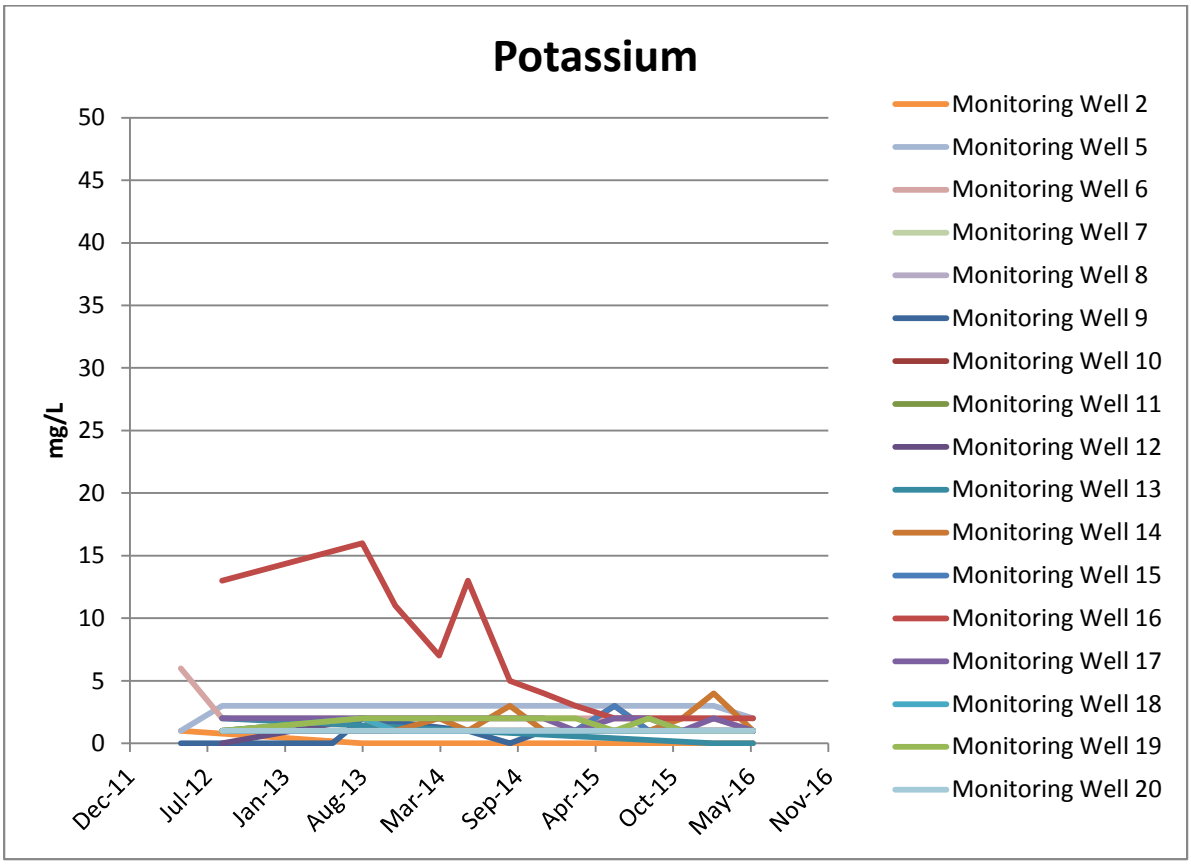


Ammonia is found in the environment, in the air, soil and water; in plants and animals. It is formed naturally by the decomposition of urine and manure. It is a source of nitrogen which is needed by plants and animals.

The monitoring wells indicate that ammonia levels in the groundwater are extremely low and often beneath the testing limits. However, monitoring point 16 has indicated a relatively higher result level. Considering that monitoring points 16 and 19 are arguably the most relevant with regard to groundwater movement away from the site, the result must continue to be monitored closely. Ammonia is arguably the clearest indicator of leachate contamination and the results from well 16 should continue to be monitored in future sampling events to be sure that the relative higher levels are not indicative of leachate migration.

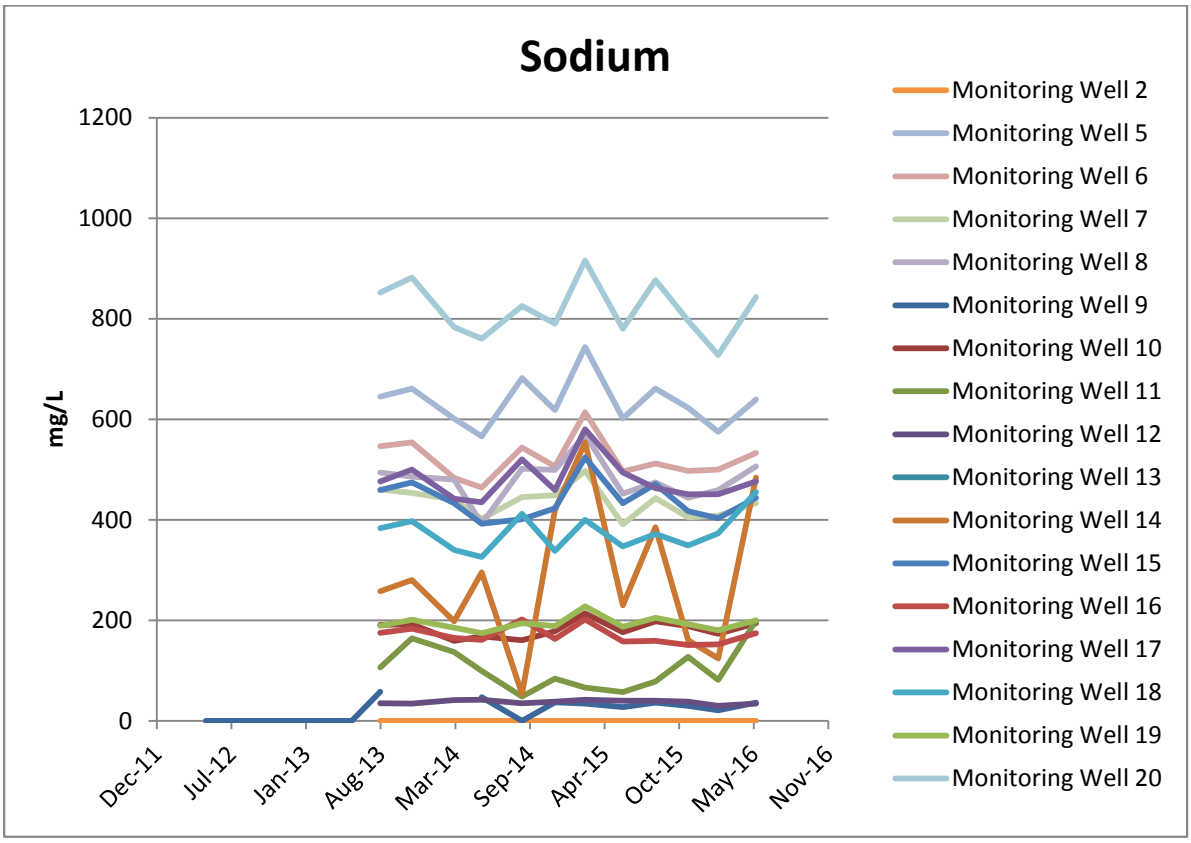
The data established over the reporting period indicates that ammonia levels in well 16 have started to stabilise at a low level of less than 1 mg/L, noting that up to 0.5 mg/L is considered suitable in drinking water.

Figure 3.2.2.6 Potassium results presentation



Potassium is present in groundwater systems outside coastal areas generally through weathering of clays and as a result of agriculture (leaching of fertiliser). Potassium may also be present in the breakdown of glass and especially cathode ray tubes. Groundwater monitoring wells indicate that potassium levels in the ground water are generally low over the available results period. Monitoring point 16 was reading higher than all other wells, but again is showing a positive overall downward trend.

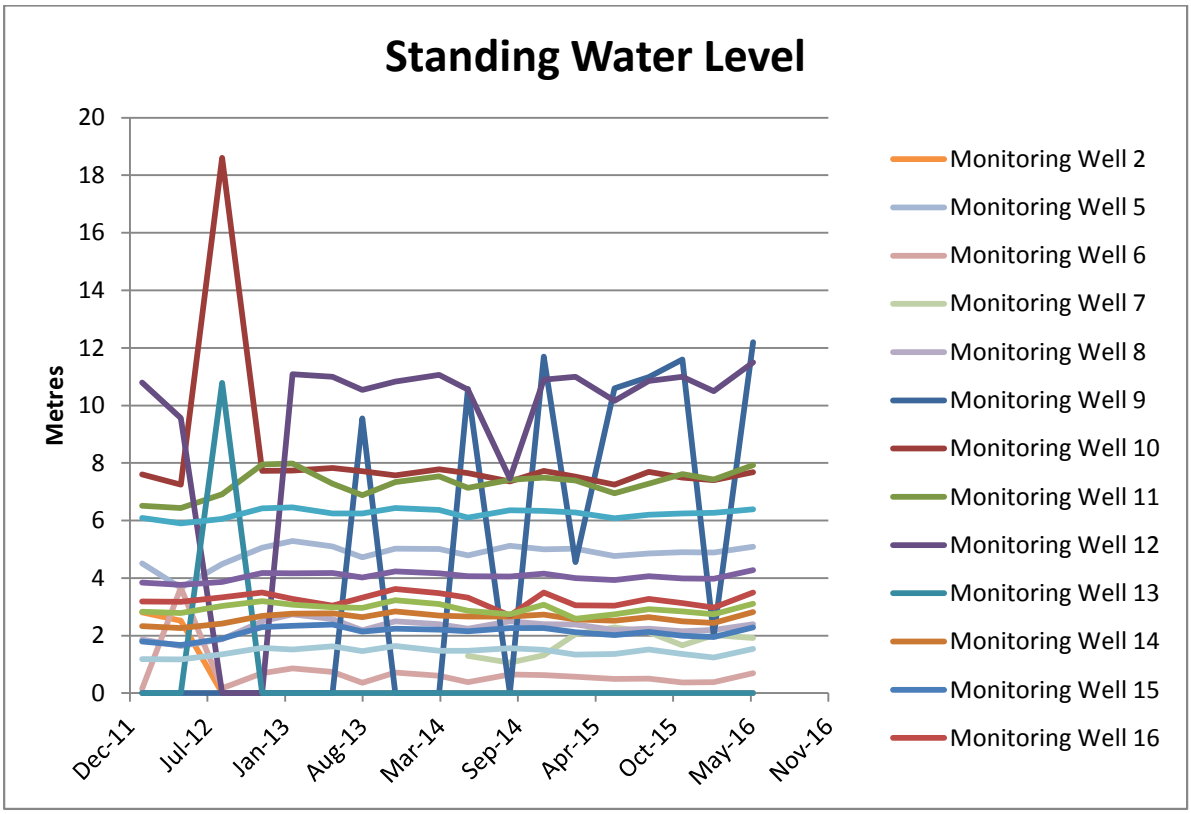
Figure 3.2.2.7 Sodium results presentation



High sodium levels can be indicative of leachate contamination infiltrating the groundwater. As presented, results for sodium over the reporting period have been in line with historical fluctuations experienced throughout the history of data available.

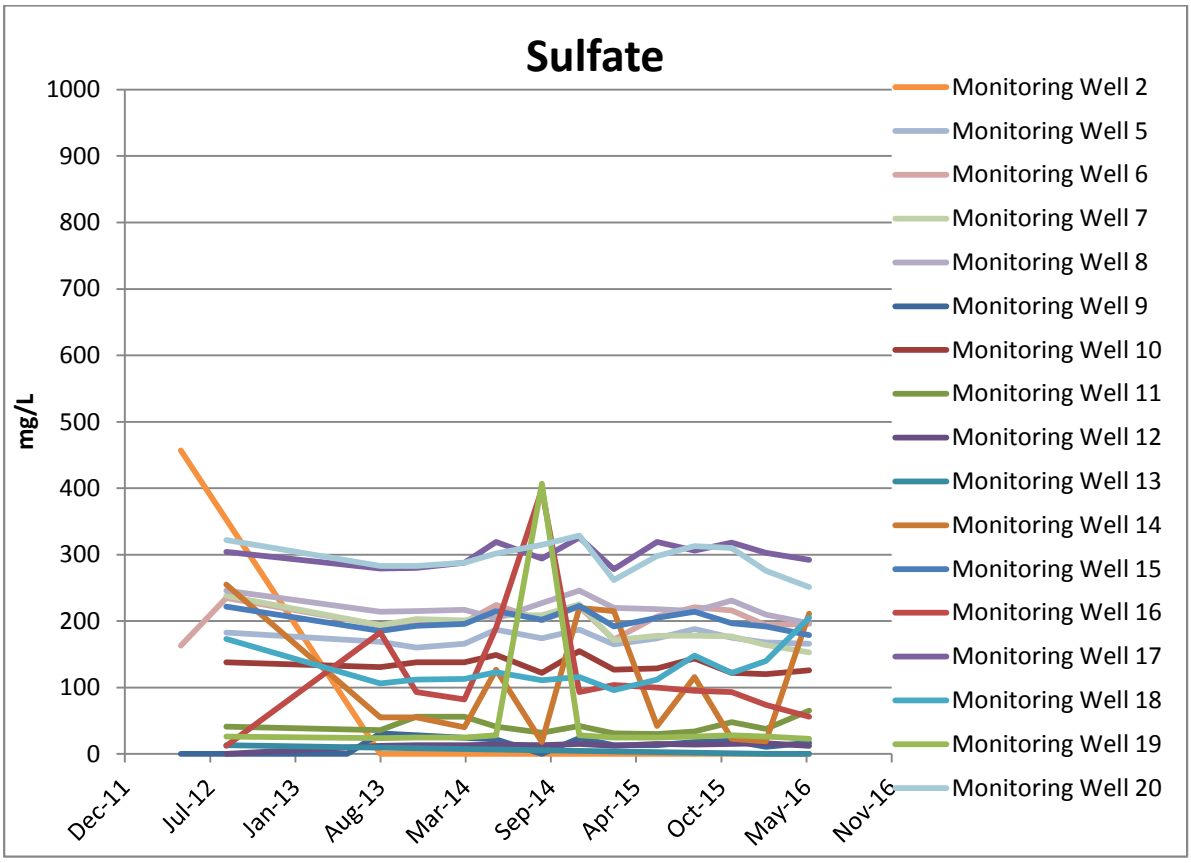
Monitoring well 14 most recently indicated an elevated fluctuation. However, the fluctuation is not a historic high level. Well 14 to be reviewed again at the next quarterly sampling event.

Figure 3.2.2.8 Standing water level presentation



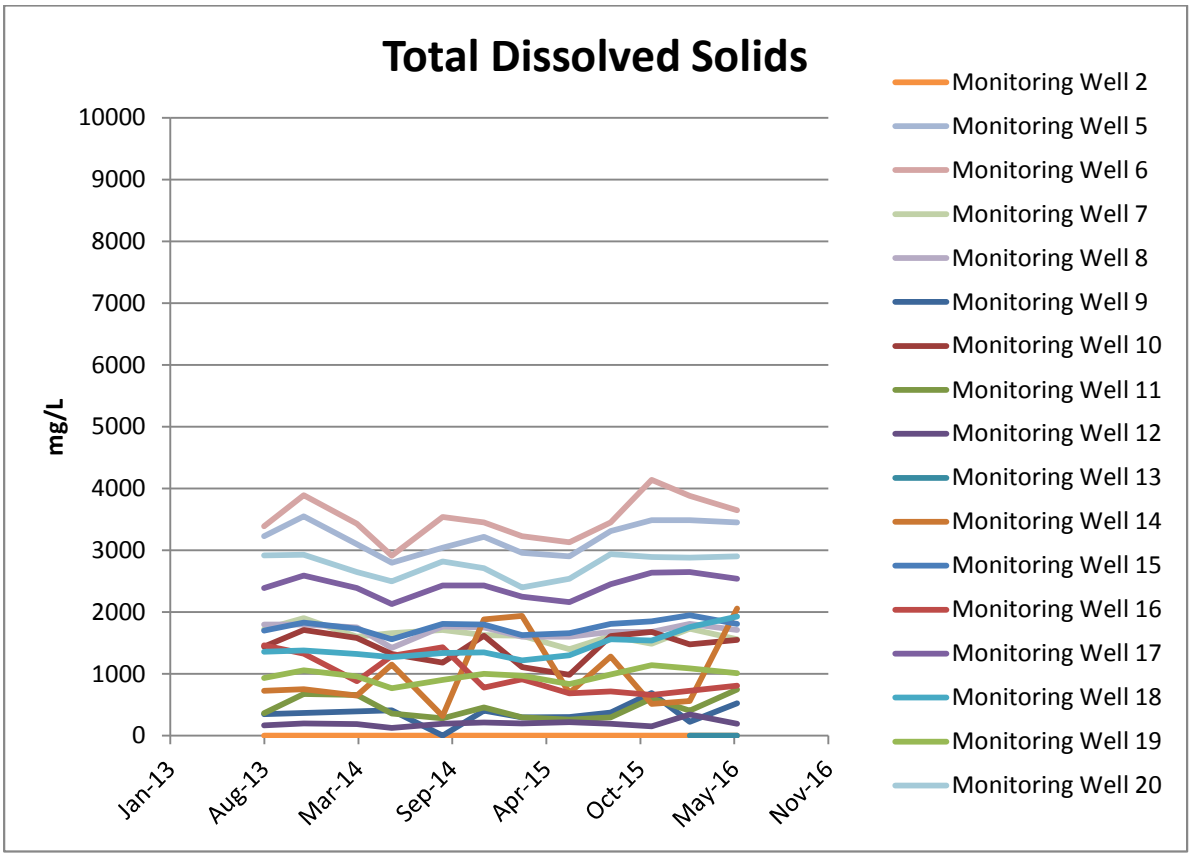
Groundwater level trends have been fairly stable, with the fluctuation over the five year testing period. It should be noted that some wells have run dry at periods, whilst well thirteen appears to be permanently dry.

Figure3.2.2.9 Sulfate results presentation



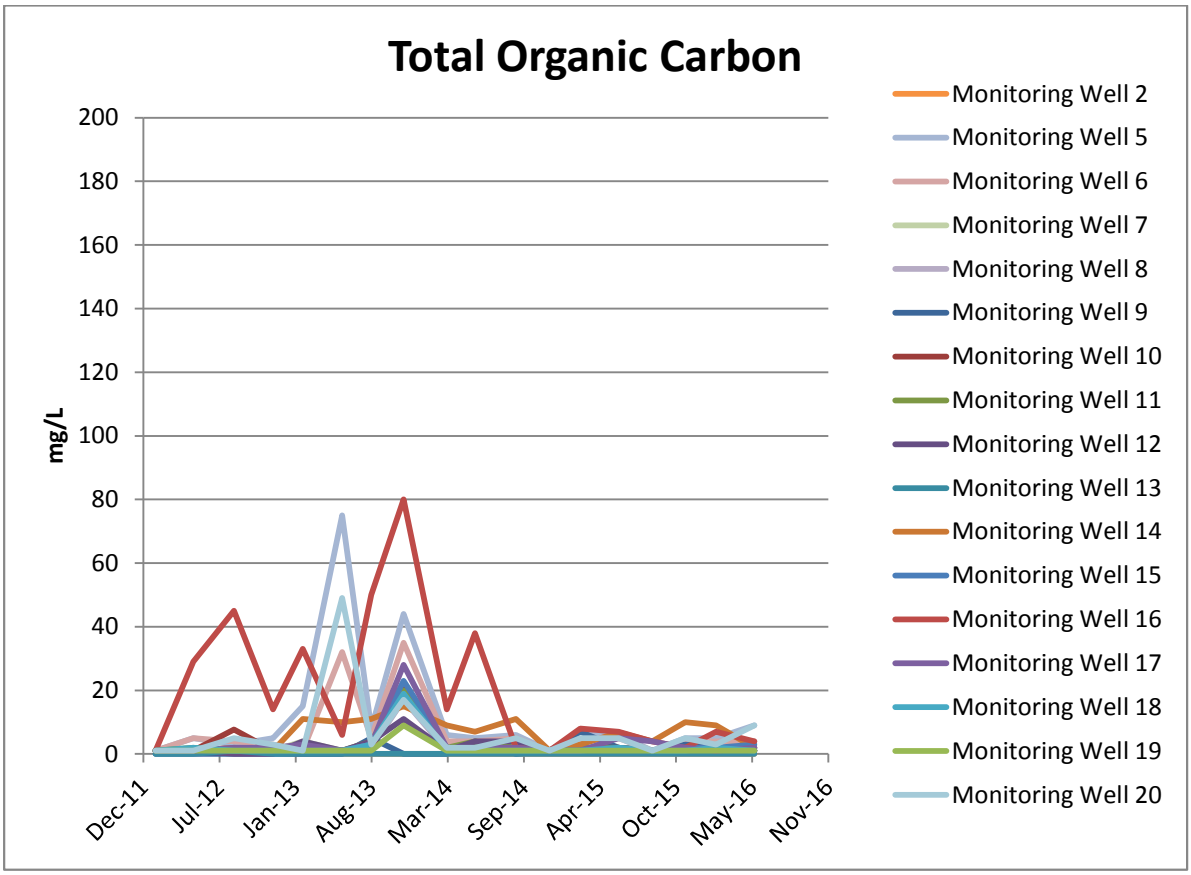
For context the *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500 mg/L. The sulfate levels in the groundwater monitoring wells are in line with the historical levels experienced at the Site and are generally better than the drinkable water standard. Inorganic ions such as sulfate provide a good indication of groundwater contamination by landfill leachate.

Figure 3.2.2.10 Total dissolved solids results presentation



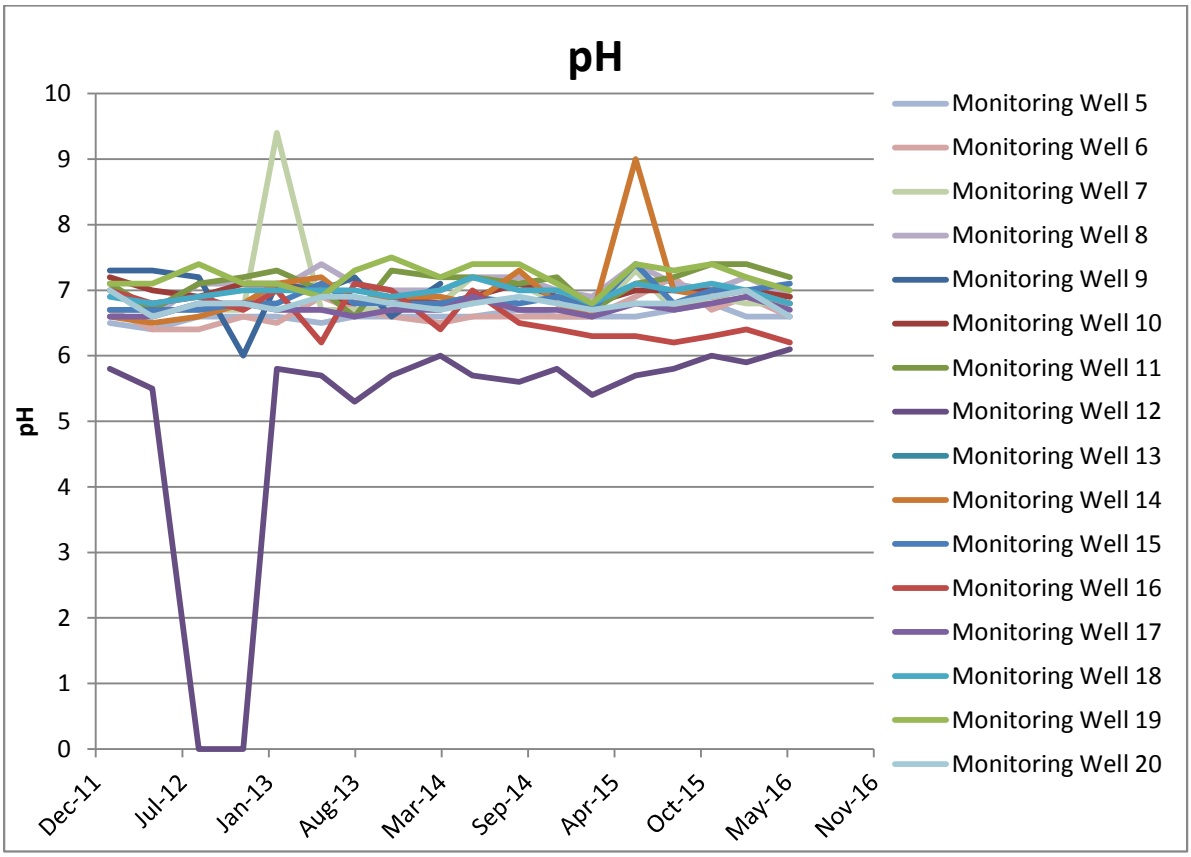
The trend for the quantity of dissolved solids has been fairly stable for the ground water monitoring wells over the reporting period, in line with historical trends. High levels of dissolved solids can be sourced from salts derived from leachate infiltration. Monitoring well 14 has most recently exhibited an upward fluctuation. Well 14 to be reviewed again at the next quarterly sampling event.

Figure 3.2.2.11 Total organic carbon results presentation



Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of groundwater contamination by organic compounds derived from the landfilling of organic materials. The amount of total organic carbon has remained relatively stable over recent years.

Figure 3.2.2.12 pH results presentation



The pH levels indicated in the groundwater monitoring wells have been extremely stable over the review period. The fluctuations have been very small except with minor anomalies that invariably return to a stable trend. The groundwater monitoring wells indicate that the historical pH of the groundwater has been maintained for over approximately five years.

3.2.3 Tabulated Results – Annual Monitoring

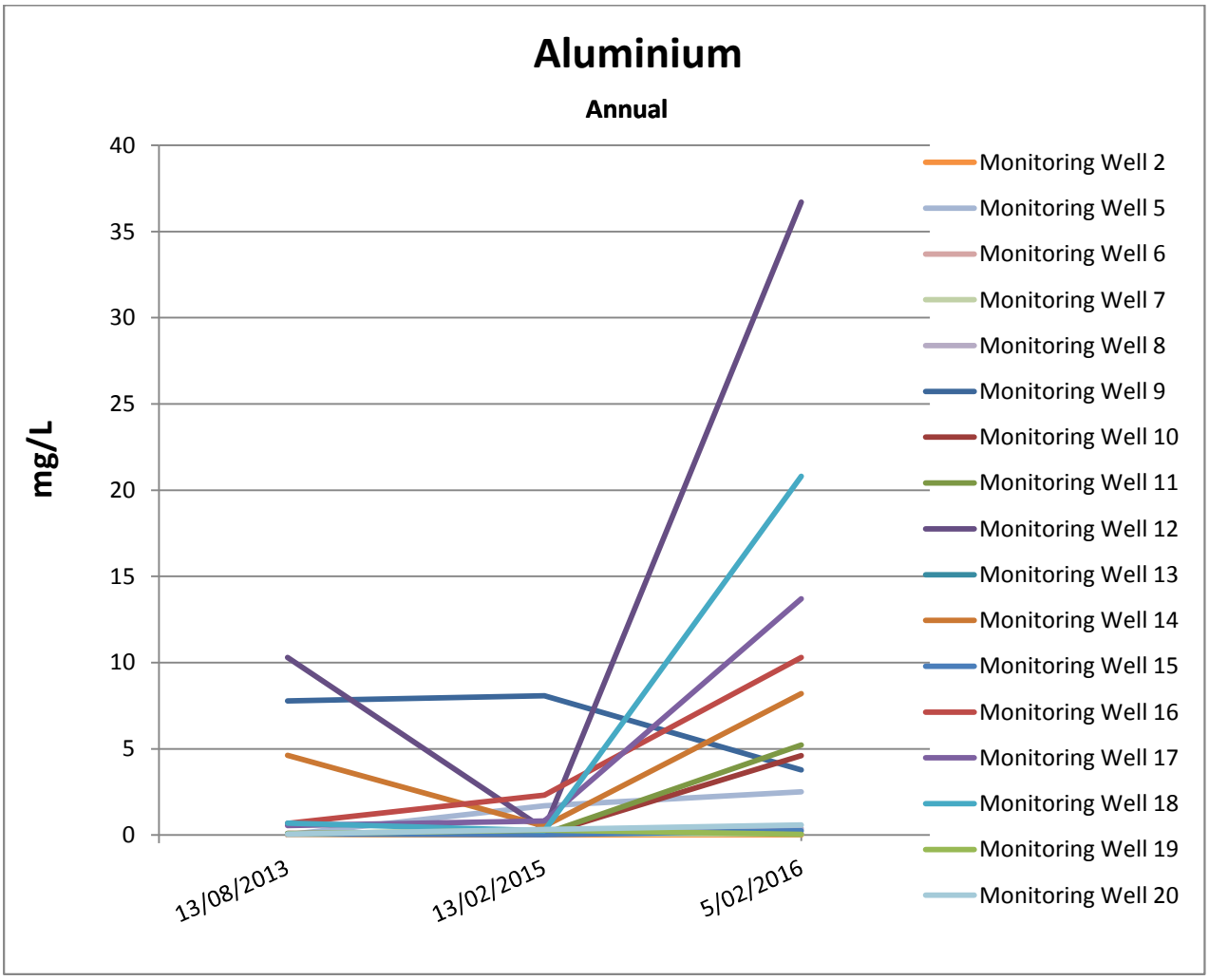
Note: Monitoring Point 2 is damaged and is scheduled for repair and Monitoring Point 13 was dry for the round of annual testing.

Table 3.2.3.1 Annual analyte testing results for 5 February 2016. *Note: Well destroyed

		Monitoring Points																
Analyte	**Units**	**2**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Aluminium	mg/L	*	2.51	0.08	0.06	0.38	3.77	4.61	5.22	36.7	Dry	8.2	.25	10.3	13.7	20.8	0.04	0.58
Arsenic	mg/L	*	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.002	Dry	0.002	<0.001	0.006	0.002	0.006	0.001	0.002
Barium	mg/L	*	0.01	0.014	0.005	0.09	0.028	0.042	0.025	0.127	Dry	0.113	0.015	0.311	0.041	0.103	0.134	0.056
Benzene	µg/	*	<1	<1	<1	<1	<1	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1
Cadmium	mg/L	*	<0.0001	0.0001	<0.001	0.0002	<0.0001	0.0001	<0.0001	<0.0001	Dry	<0.00 01	<0.0001	0.0006	<0.00 01	<0.0001	<0.0001	<0.00 01
Chromium (hex.)	mg/L	*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	Dry	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Chromium (total)	mg/L	*	0.002	<0.001	<0.001	<0.001	<0.001	0.006	0.004	0.023	Dry	0.007	<0.001	0.012	0.013	0.01	0.001	0.001
Cobalt	mg/L	*	<0.001	0.003	<0.001	0.002	<0.001	0.0001	0.004	0.014	Dry	**0.007**	<0.001	0.048	0.013	0.017	<0.001	0.012
Copper	mg/L	*	0.007	0.009	0.004	0.01	0.01	0.08	0.018	0.059	Dry	0.025	0.018	0.045	0.024	0.045	0.004	0.014
Ethyl Benzene	µg/L	*	<2	<2	<1	<2	<2	<2	<2	<2	Dry	<2	<2	<2	<2	<2	<2	<2
Fluoride	mg/L	*	0.6	0.5	0.5	0.9	0.2	0.4	0.7	0.3	Dry	0.3	0.7	0.1	0.4	0.5	0.4	0.8
Lead	mg/L	*	0.002	<0.001	<0.001	0.003	0.002	0.009	0.005	0.02	Dry	0.007	<0.001	0.021	0.011	0.023	<0.001	0.004
Manganese	mg/L	*	0.05	0.428	0.005	0.178	0.028	0.336	0.413	0.676	Dry	0.624	0.011	3.22	0.524	0.755	0.03	1.7
Mercury	mg/L	*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	Dry	<0.00 01	<0.0001	<0.0001	<0.00 01	<0.0001	<0.0001	<0.00 01
Nitrate	mg/L	*	<0.01	<0.01	<0.01	0.01	0.26	0.13	0.02	0.84	Dry	0.02	0.06	0.04	0.16	<0.01	0.19	0.07
Nitrite	mg/L	*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Dry	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OCP	µg/	*	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Dry	0.5	0.5	0.5	0.5	0.5	0.5	0.5
OPP	µg/	*	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Dry	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PAH	µg/	*	<1	<1	<1	<1	<1	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/	*	<2	<2	<2	<2	<2	<2	<2	<2	Dry	<2	<2	<2	<2	<2	<2	<2
TPH	µg/	*	<50	<50	<50	<50	<50	<50	<50	<50	Dry	<50	<50	<50	<50	90	<50	<50
Total Phenolics	mg/L	*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Dry	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene	µg/	*	<2	<2	<2	<2	<2	<2	<2	<2	Dry	<2	<2	<2	<2	<2	<2	<2
Zinc	mg/L	*	0.017	0.015	0.013	0.031	0.017	0.081	0.025	0.077	Dry	0.034	0.015	0.178	0.047	0.07	0.006	0.024

3.2.4 Data Presentation – Annual Monitoring

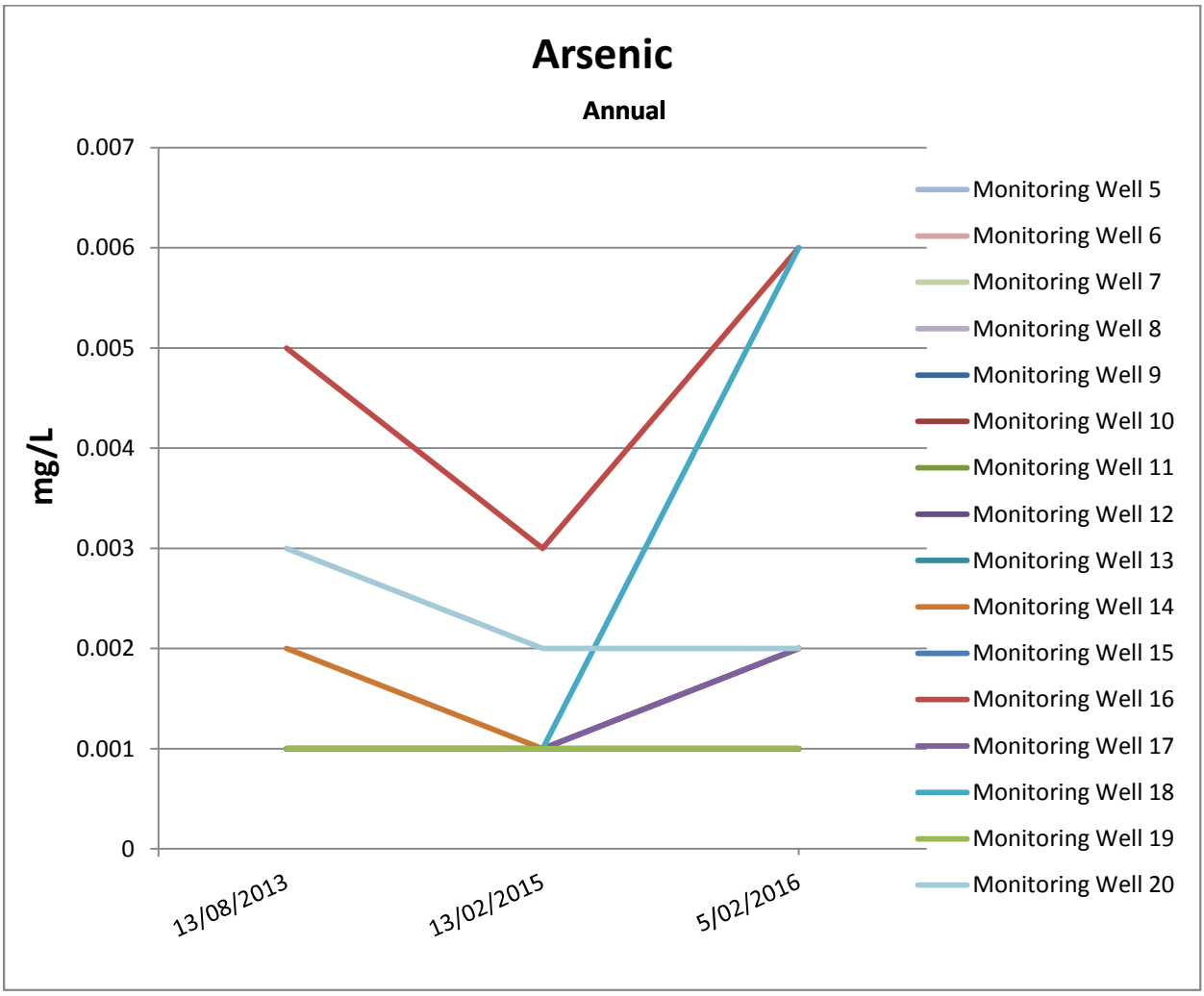
Figure 3.2.4.1 Aluminium results presentation



Aluminium levels in the sampled groundwater monitoring points 12 and 18 are relatively higher than the other point's onsite. Whilst aluminium is naturally abundant in rocks and soil (third most abundant element in the earth's crust), anthropogenic releases are typically in the form of air emissions, waste water effluents, and solid waste primarily associated with industrial processes, such as aluminium production.

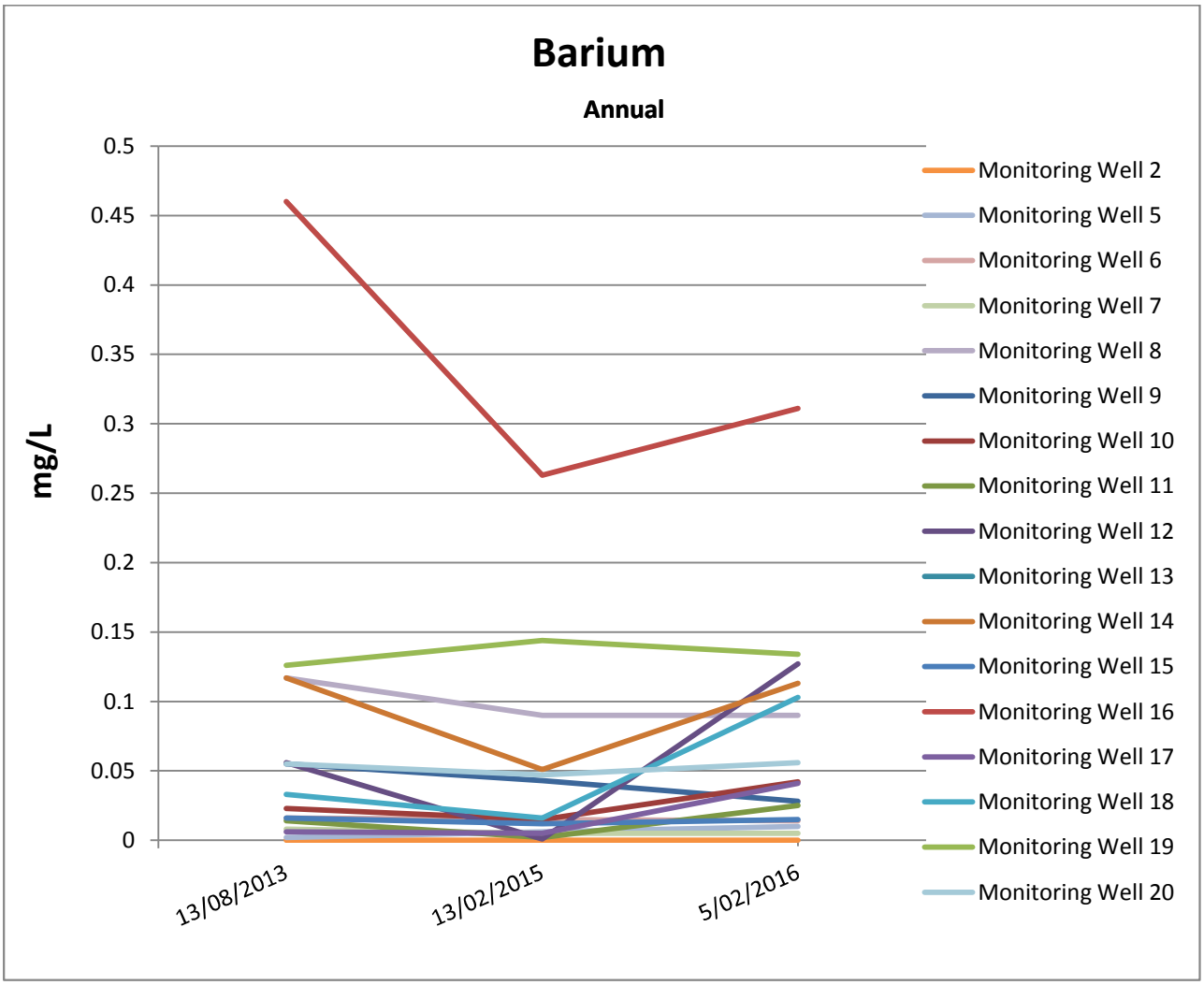
Monitoring well 12 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing.

Figure 3.2.4.2 Arsenic results presentation



The US EPA sets the maximum contaminant level of arsenic in groundwater at 0.05mg/L. Therefore amount of arsenic found in the groundwater monitoring wells over the reporting period is considered to be extremely low. In fact arsenic levels are below detectable limits (0.001 mg/L) in the majority of the test results.

Figure 3.2.4.3 Barium results presentation

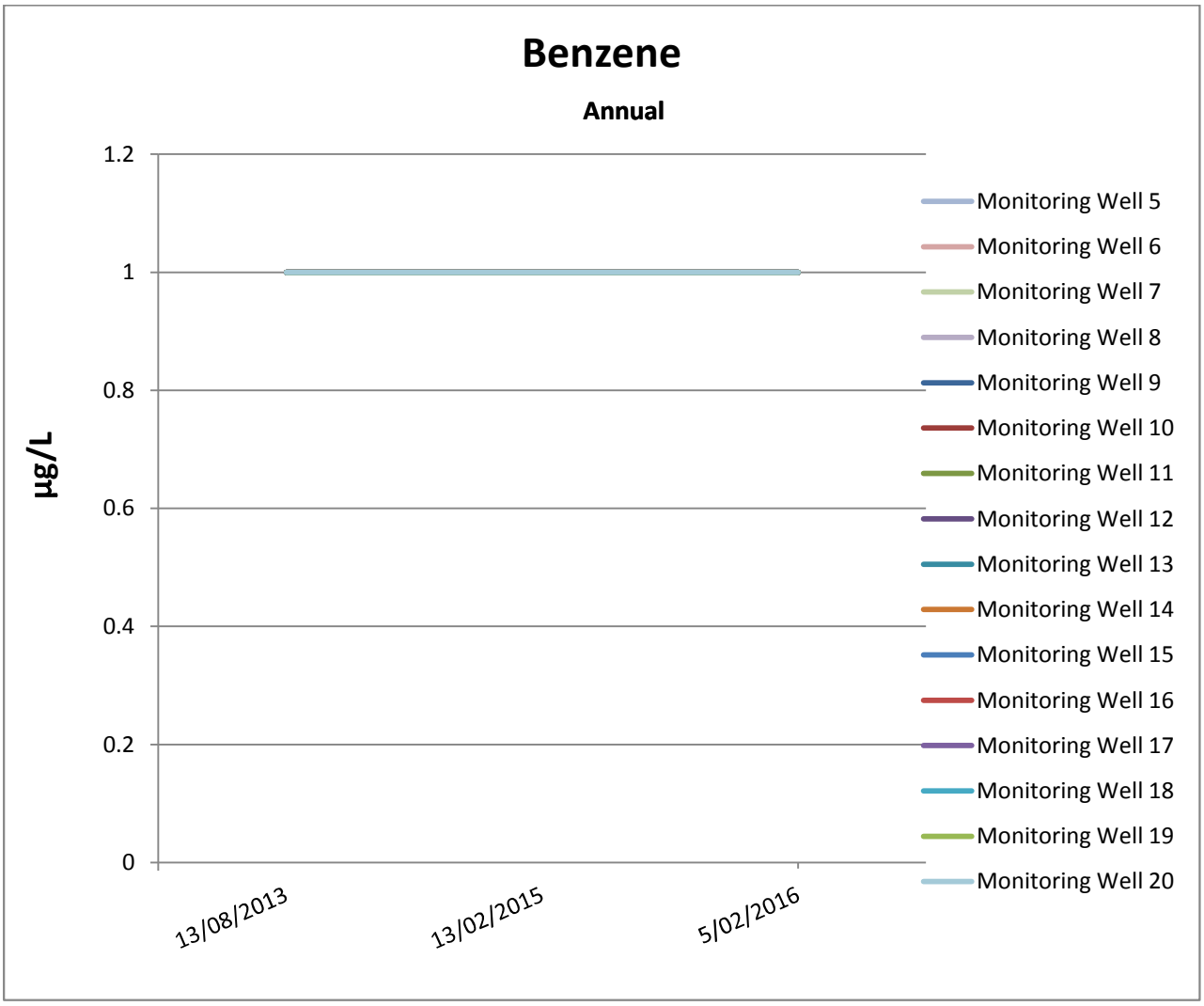


Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, ceramics, glass, and rubber.

The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 2 mg/L of barium is safe for consumption. Barium levels are therefore extremely low and stable in the sites groundwater.

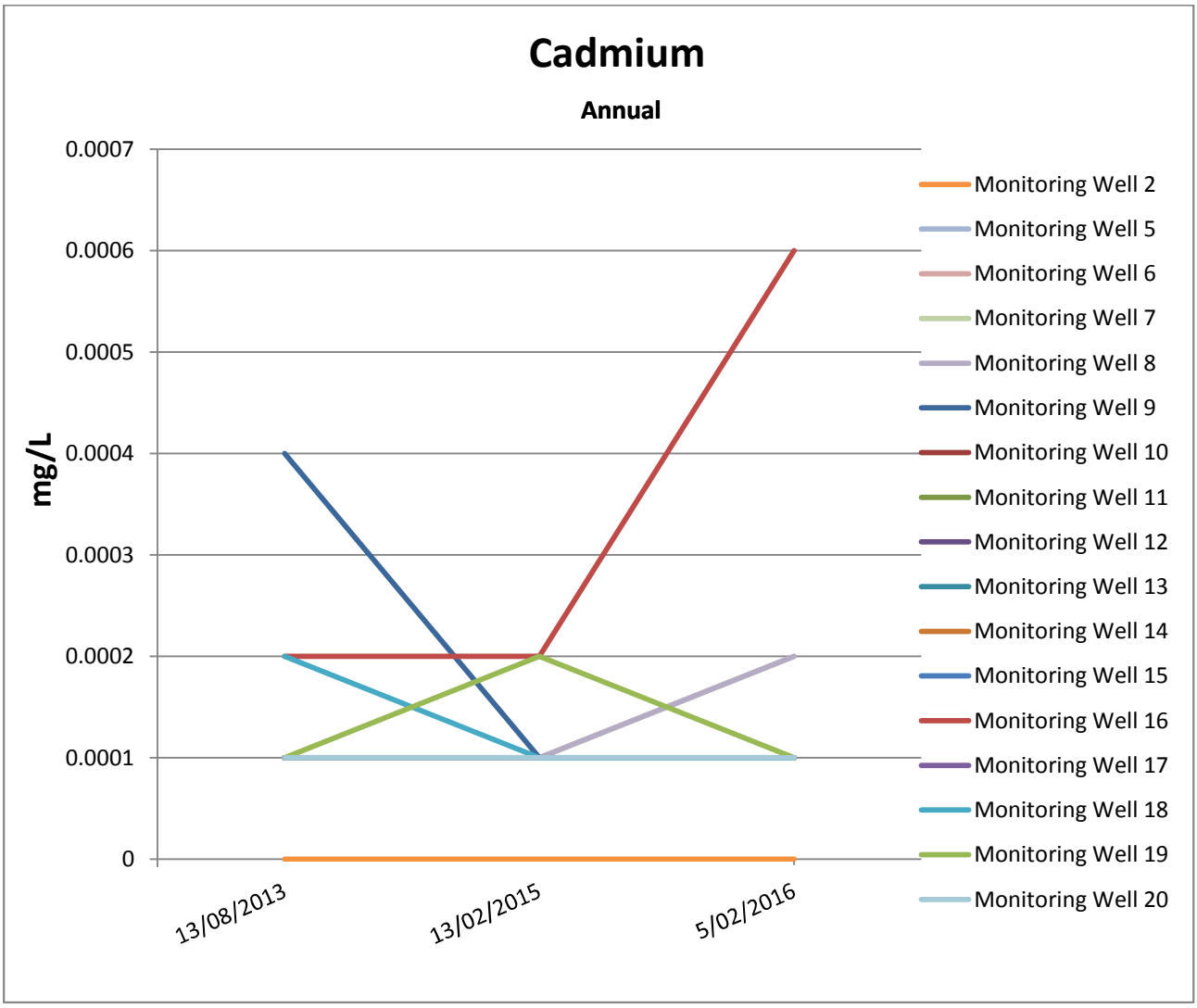
Monitoring well 10 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing.

Figure 3.2.4.4 Benzene results presentation



Benzene concentrations are non-existent at the Site. Every instance of benzene sampling has not yielded a result due to the concentration of benzene being below laboratory testing thresholds.

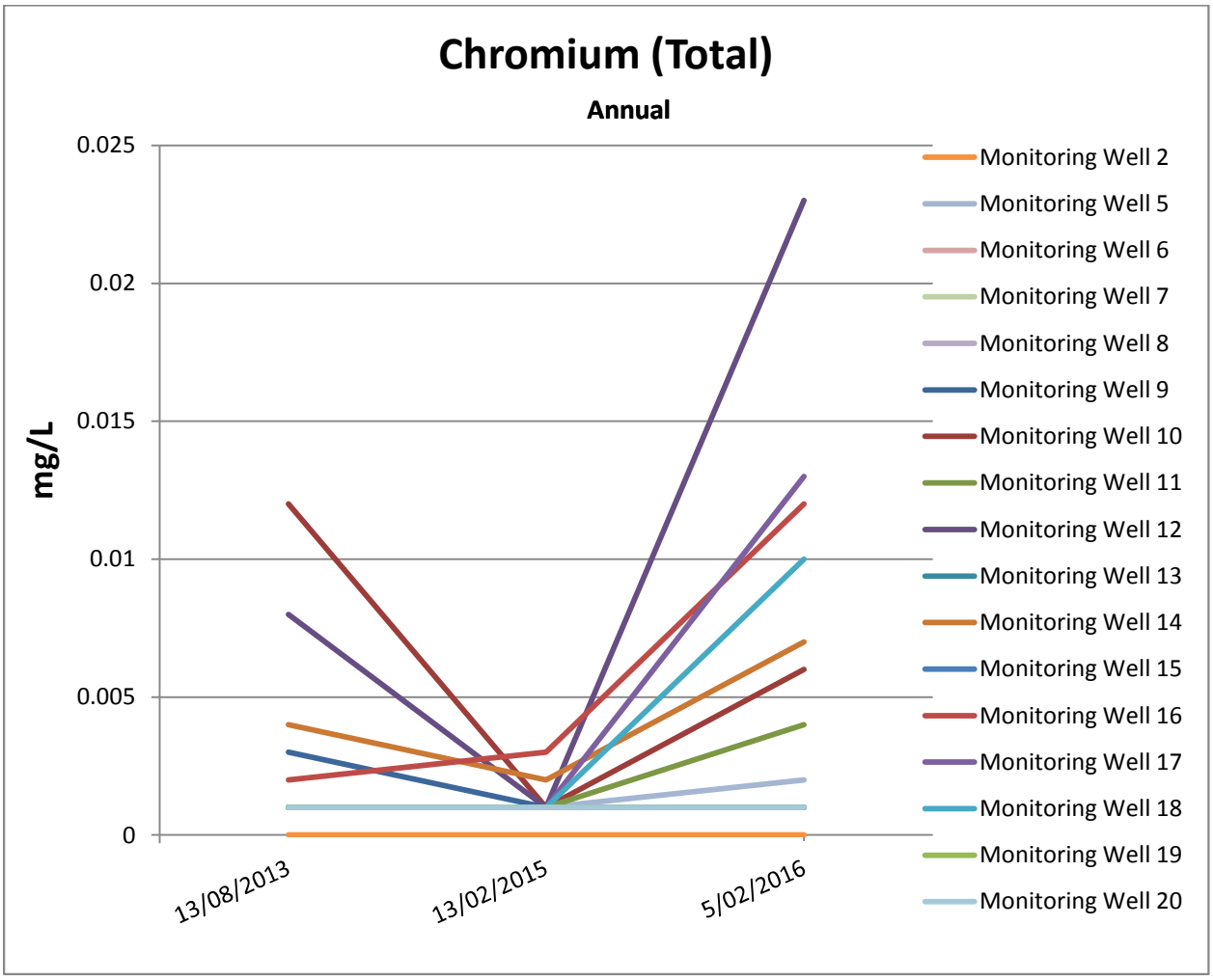
Figure 3.2.4.5 Cadmium results presentation



The US EPA sets the maximum contaminant level of cadmium in groundwater at 0.01mg/L. Cadmium levels present in the ground water monitoring wells are extremely low. Cadmium levels are always below 0.01 mg/L and below detectable limits in the majority of readings taken during the reporting period.

Whilst monitoring well 10 exhibits relatively higher concentrations of cadmium, the real concentration of up to 0.0006 mg/L is extremely low.

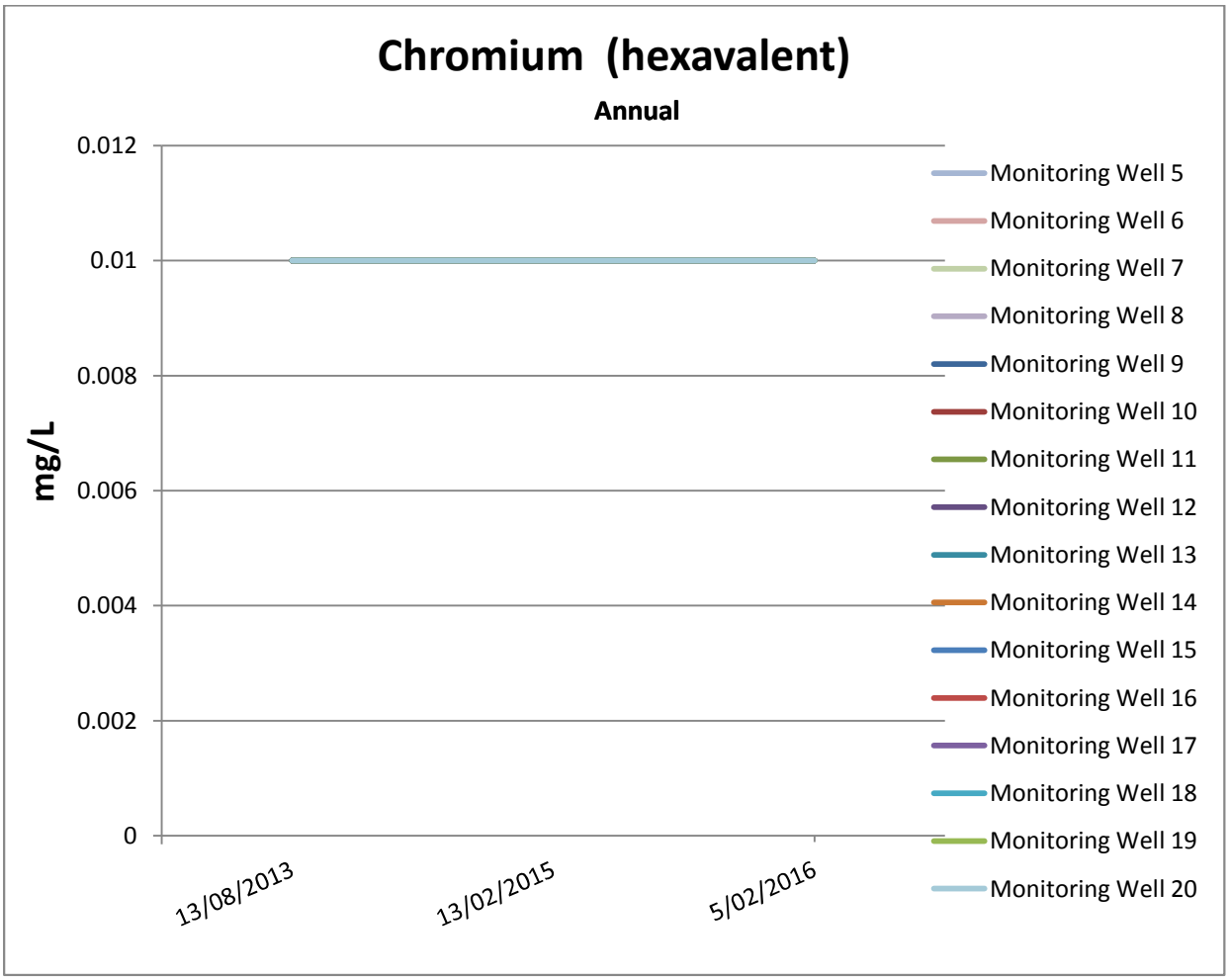
Figure 3.2.4.6 Chromium results presentation



The US EPA sets the maximum contaminant level of chromium in groundwater at 0.05mg/L The levels of chromium detected in the ground water monitoring wells over the reporting period have been extremely low.

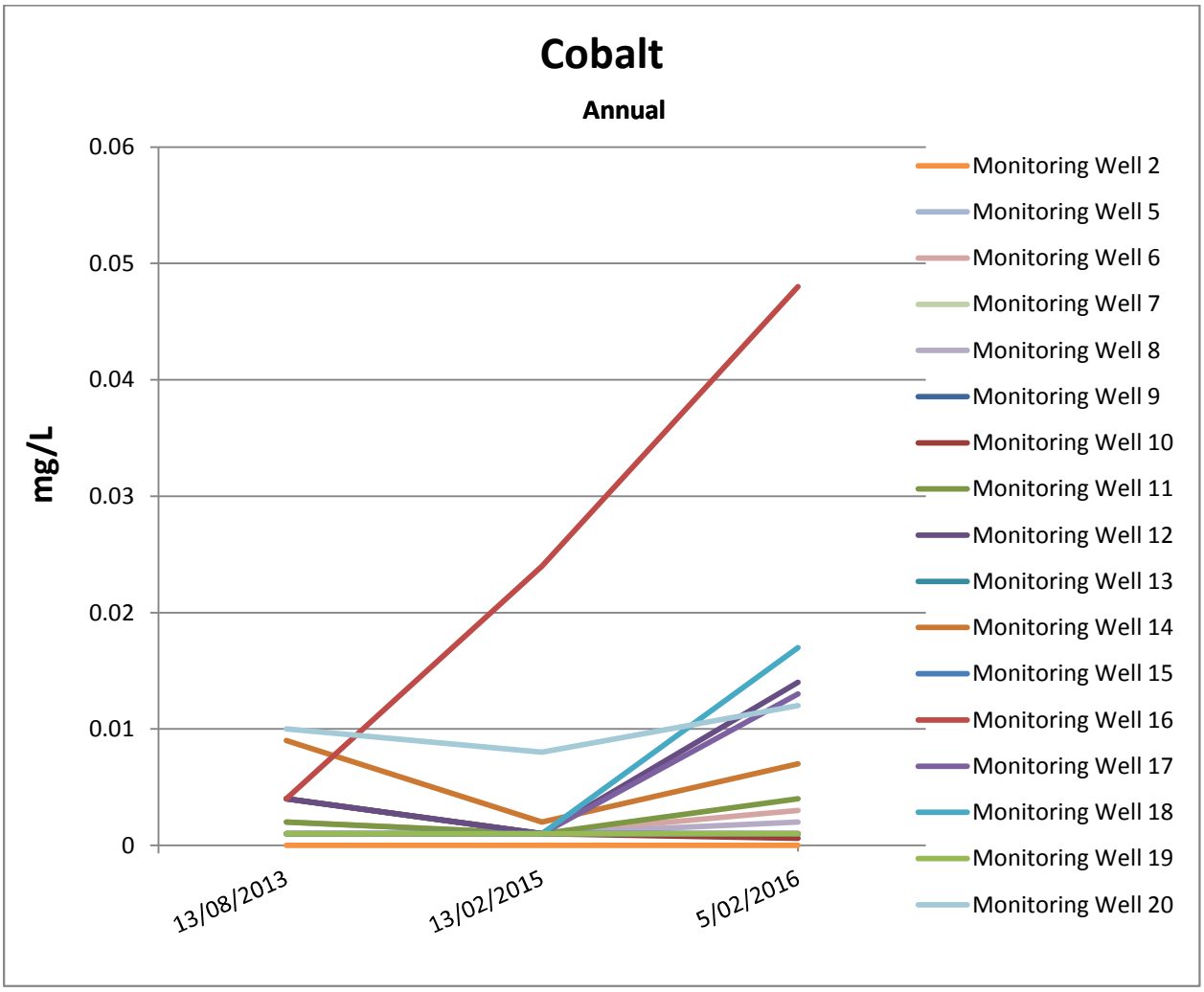
Monitoring well 12 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing.

Figure 3.2.4.7 Chromium (hexavalent) results presentation



Hexavalent chromium has not been detected in any samples taken for the Site. The demonstrated model shows that the concentration of hexavalent chromium results received is below laboratory testing thresholds.

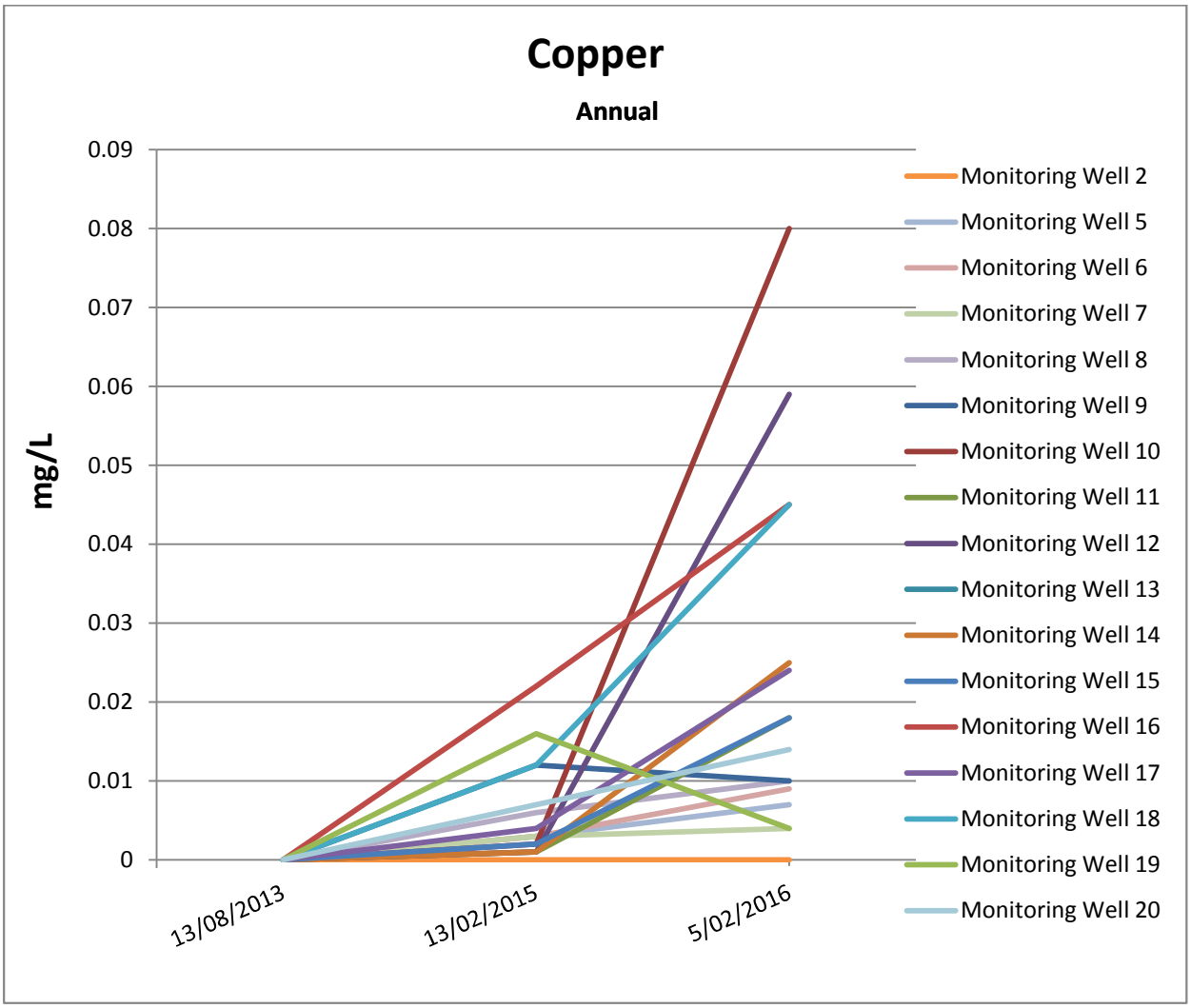
Figure 3.2.4.8 Cobalt results presentation



Anthropogenic sources of cobalt in the environment include agricultural runoff (trace amounts), sewage effluent, paints, inks and from electroplating in batteries. Worksafe Australia limits cobalt exposure to 0.05 mg/m^3 over 8 hours. The comparison concentration of cobalt in well 10 is one thousand times lower at 0.00005 mg/m^3.

The relatively higher level of cobalt in well 16, whilst still exceedingly low, is noteworthy and should be re-reviewed during the next round of annual testing. Accumulation is not thought to be an issue due to cobalt's small half-life.

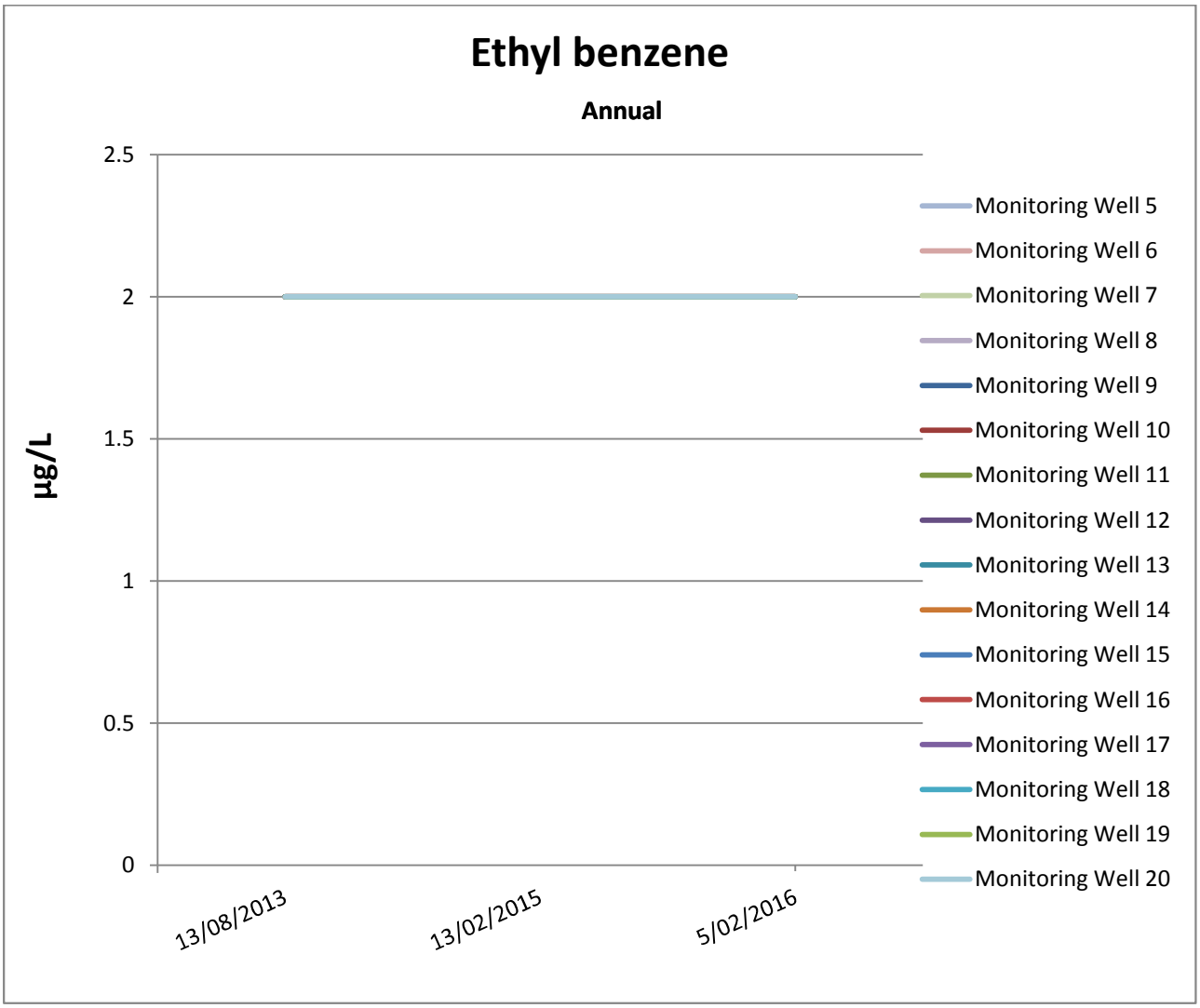
Figure 3.2.4.9 Copper results presentation



Tested results from the ground water monitoring wells show an extremely small amount of copper. The *2011 Australian Drinking Water Guidelines 6* prescribes an aesthetic limit of 1 mg/L of copper in drinking water. Clearly, the results therefore indicate that copper contamination is not evident.

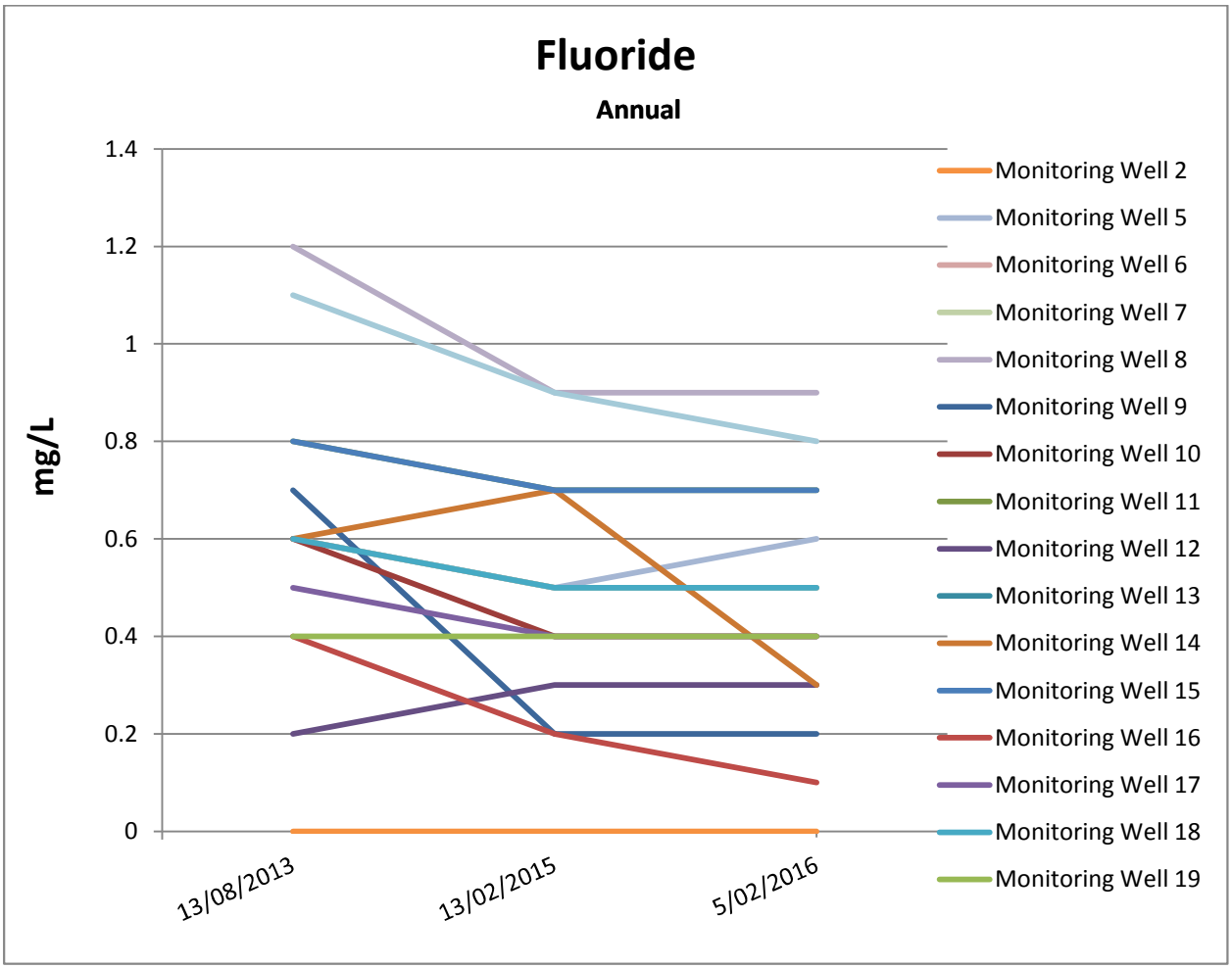
Monitoring wells 10 and 12 are located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing. Whilst the levels appear relatively high, the actual concentration is still considered as very low.

Figure 3.2.4.10 Ethyl Benzene results presentation



Ethyl benzene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity above laboratory testing limits.

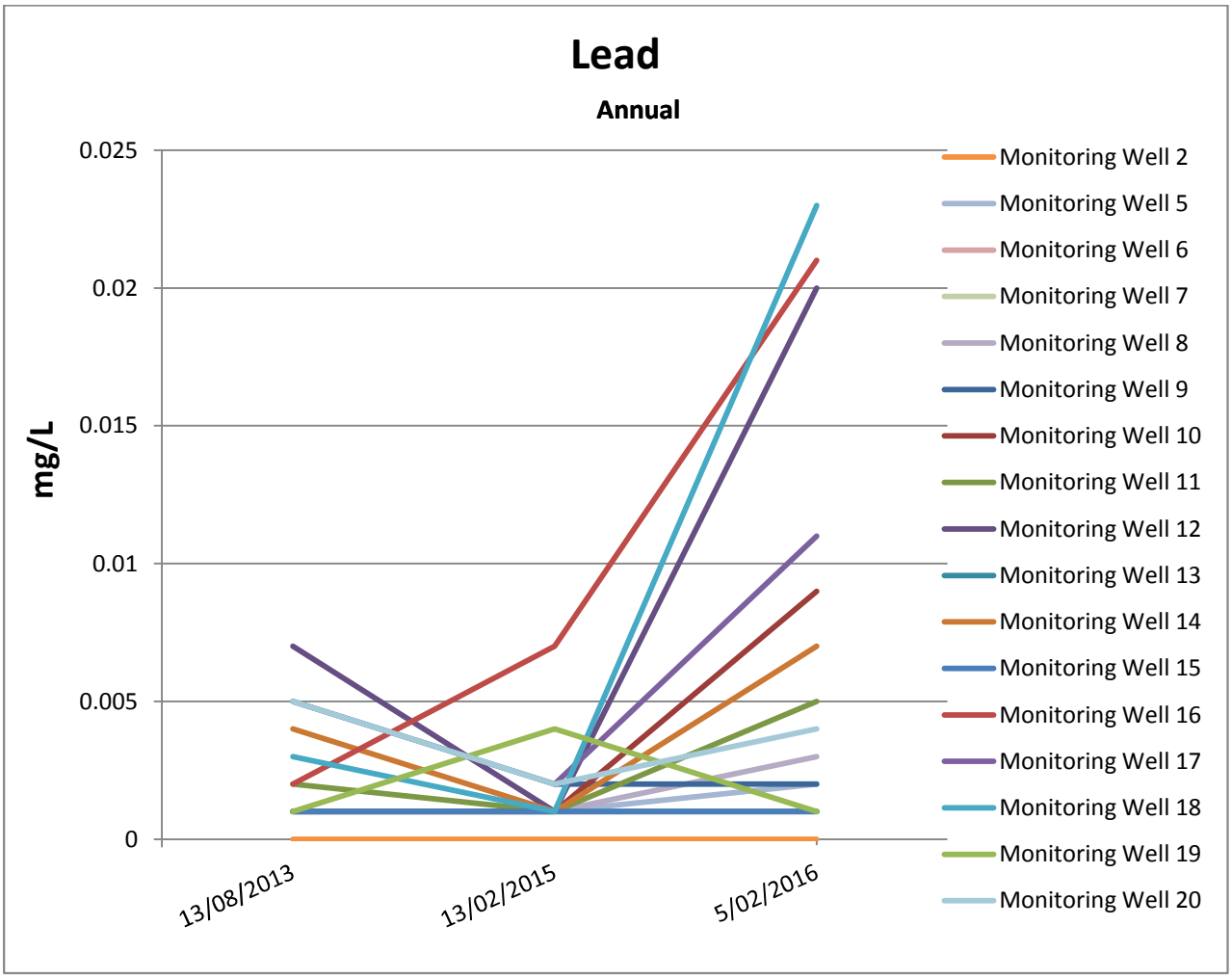
Figure 3.2.4.11 Fluoride results presentation



Industrial emissions are understood to be the primary anthropogenic pathway for fluoride to enter the environment. The US EPA sets the maximum contaminant level of fluoride in groundwater at 4 mg/L. Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L.

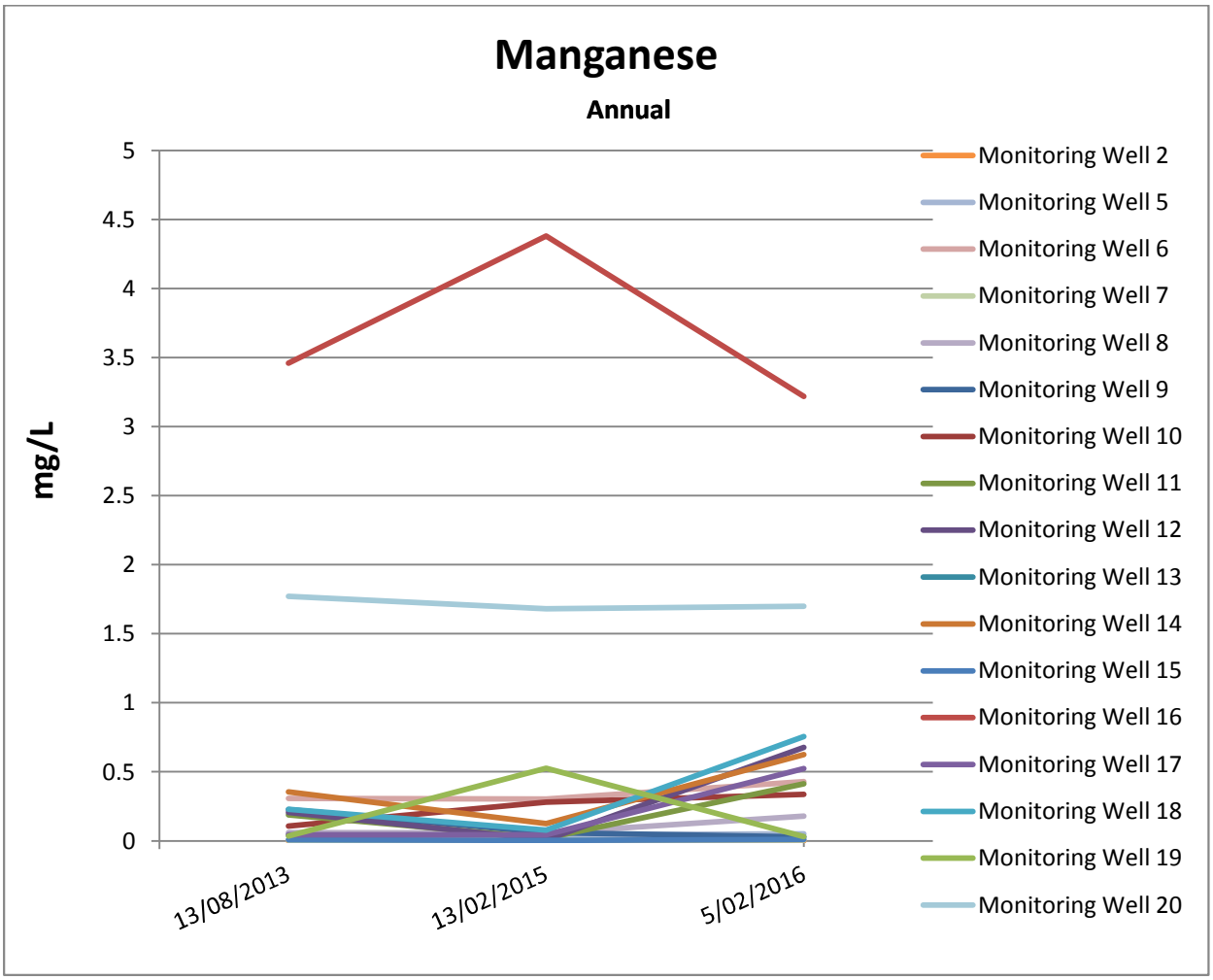
The fluoride concentrations found in the Sites groundwater are considered to be quite stable.

Figure 3.2.4.12 Lead results presentation



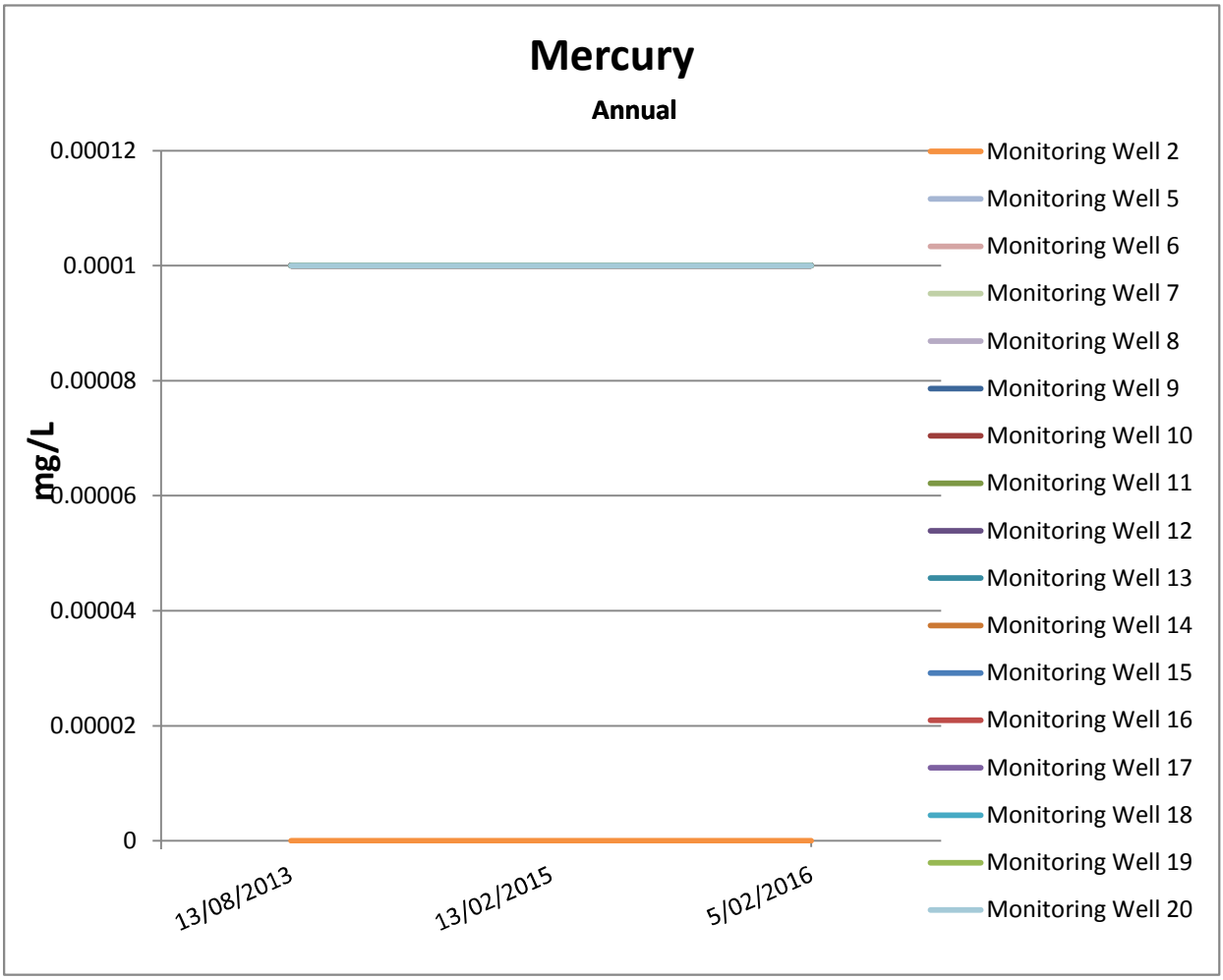
Heavy metal contamination in the groundwater in the form of lead is at very low levels. The presented data on the surface appears to indicate a steep climb of most locations during the reporting period. However, the results are extremely close to the testing limits achievable in a laboratory. For perspective, 95% of the samples taken indicate that lead levels are safe to consume.

Figure 3.2.4.13 Manganese results presentation



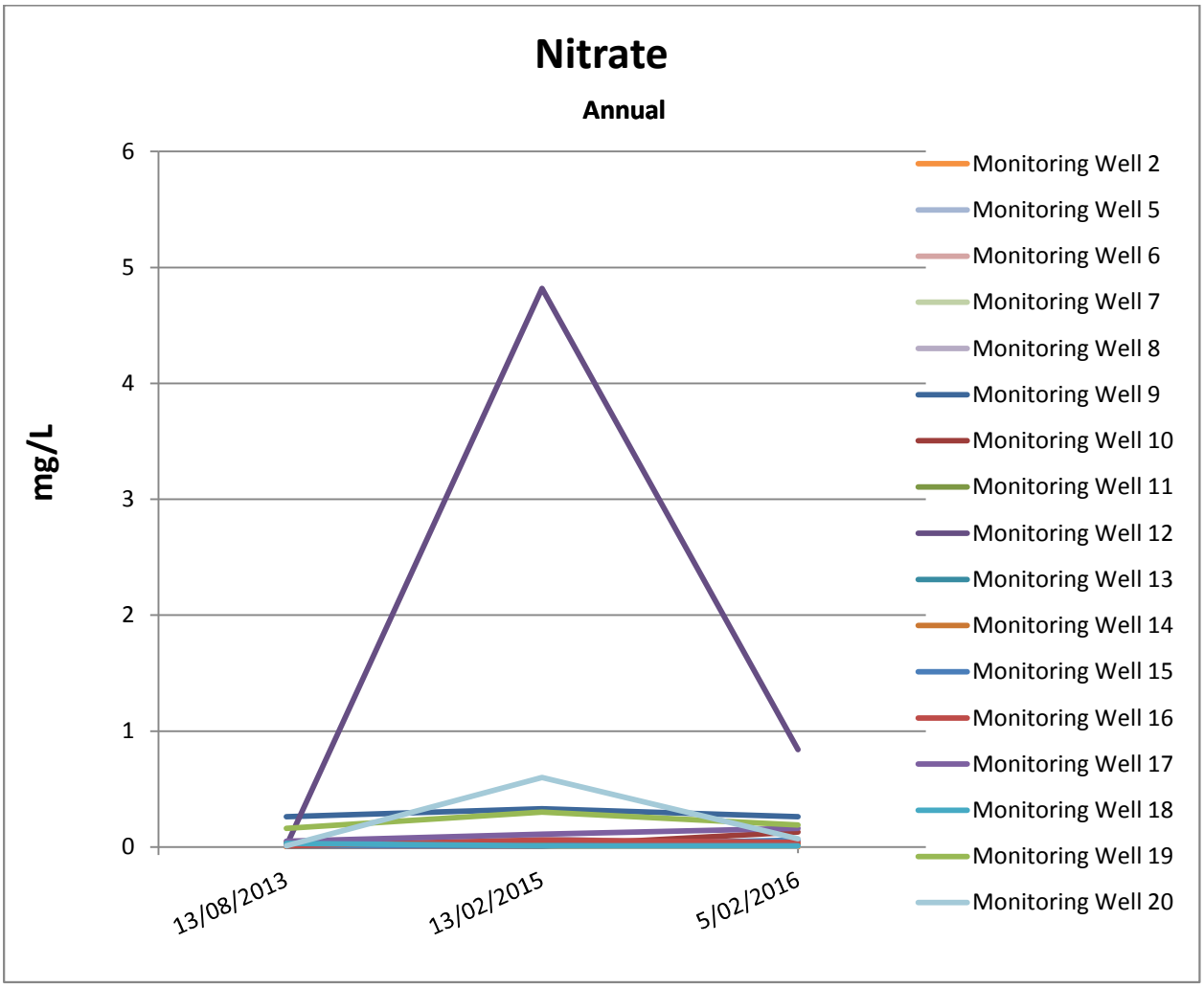
Manganese can be a strong indicator of landfill leachate in groundwater leached from hazardous waste sites and commonly derived from battery disposal. Monitoring points 16 and 20 have demonstrated relatively higher levels of manganese over the three year monitoring history. These results are at odds with surrounding monitoring wells and are separated by other wells that do not show elevated results. Continued annual monitoring will help determine the stability of manganese concentration in these locations.

Figure 3.2.4.14 Mercury results presentation



Mercury has not been detected at any level at the Site. All results provide concentrations below the limit of laboratory testing.

Figure 3.2.4.15 Nitrate results presentation



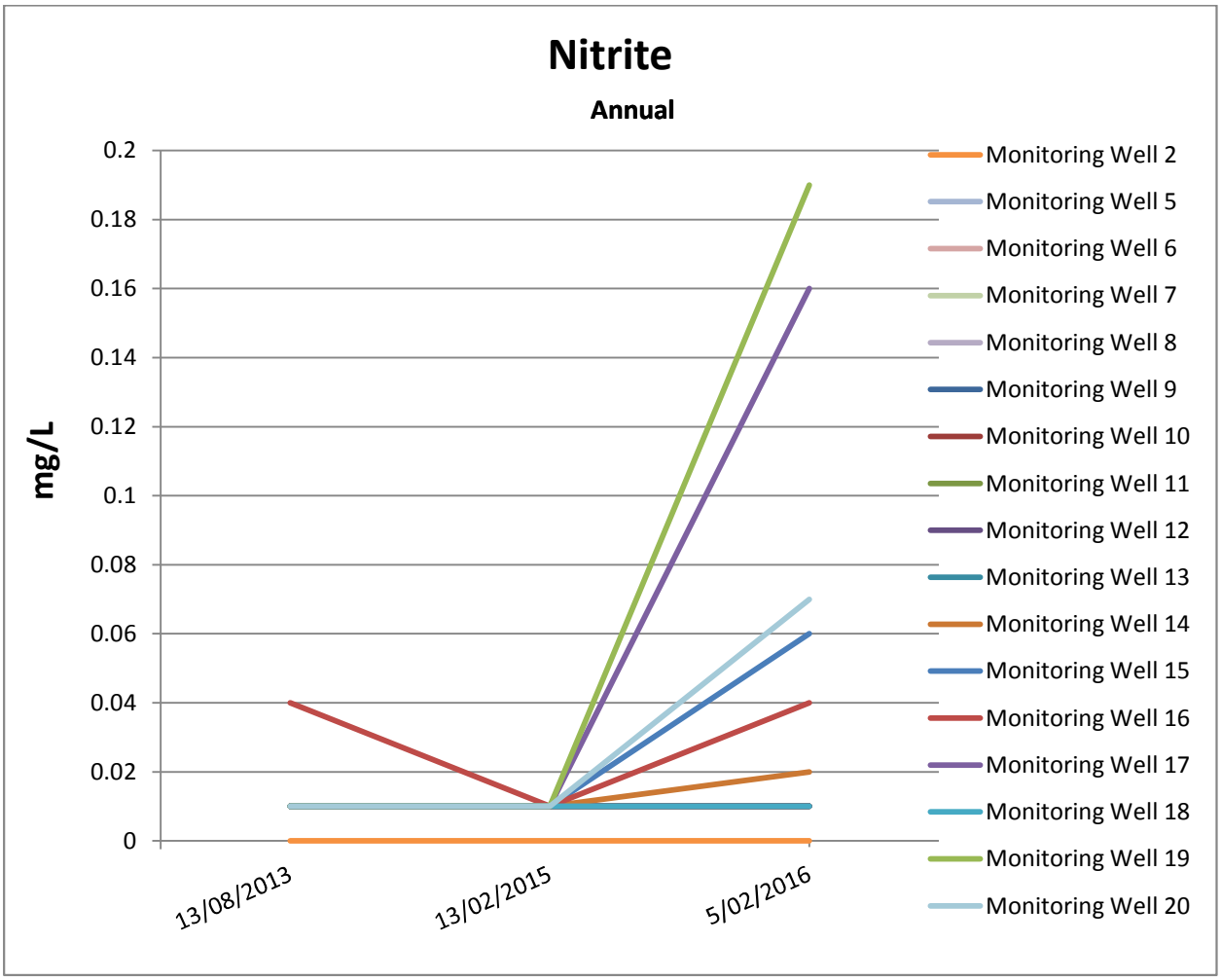
The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 50 mg/L of nitrate is safe for consumption.

Nitrate and nitrite are naturally occurring ions that are part of the nitrogen cycle that includes the decomposition of organic matter, such as what takes place in landfills. Denitrification is a process common in leachate treatment where the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form occurs. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen.

The World Health Organisation suggests that nitrate concentration in surface water is normally between up to 18 mg/L, therefore the levels found in the monitoring wells on Site are considered to be relatively low.

Monitoring wells 12 is located in an up gradient location and represents groundwater flow into the WWARRP from adjacent land used for cattle grazing. The elevated 2015 result has more recently started to return to the concentration found in other monitoring wells.

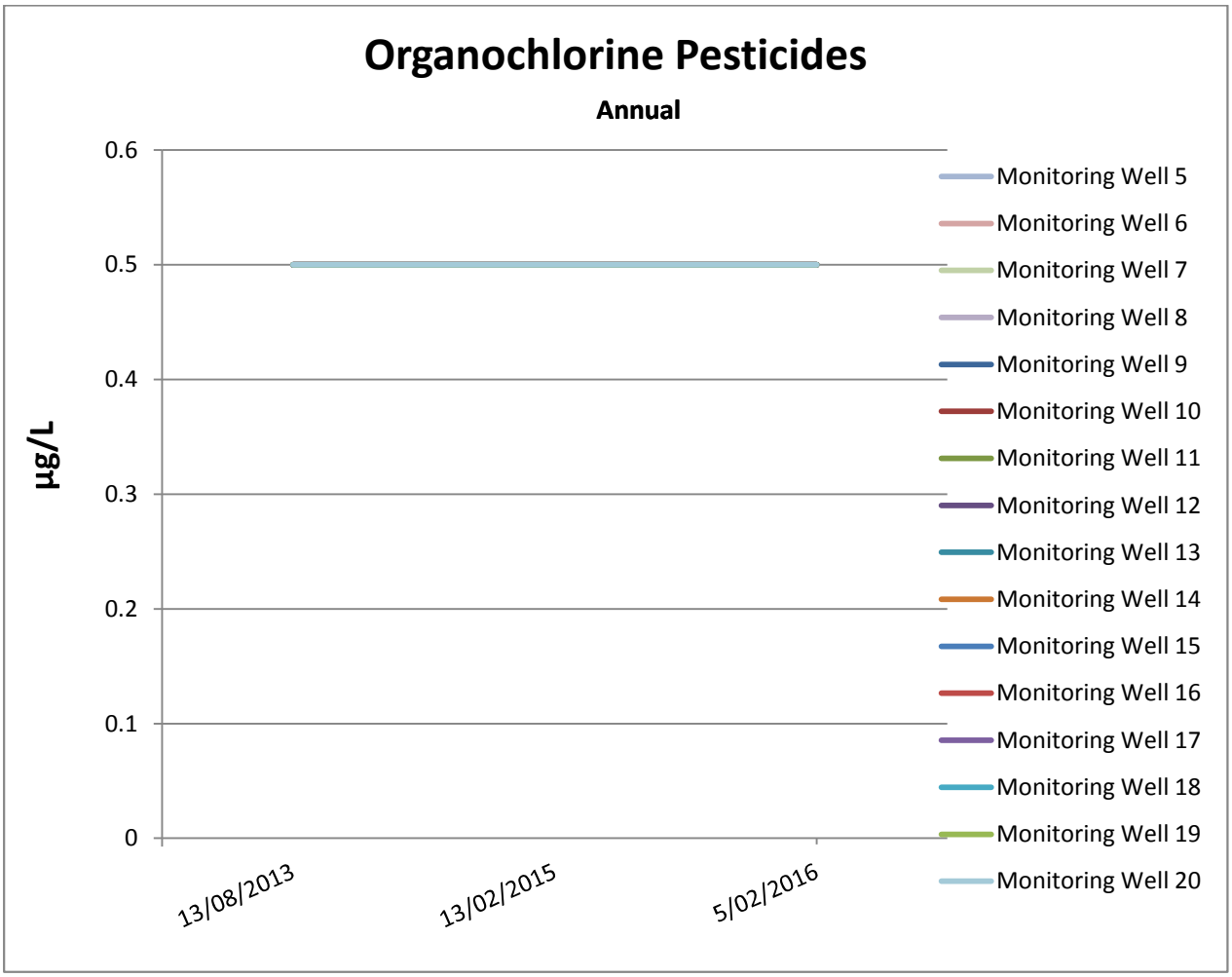
Figure 3.2.4.16 Nitrite results presentation



Nitrification is a twostep aerobic biological process where bacteria known as nitrosomonas convert ammonia and ammonium to nitrite. Next, bacteria called nitrobacter finish the conversion of nitrite to nitrate. The conversion of nitrite to nitrate is generally very fast and nitrite levels are therefore invariably quite low. More toxic than nitrate, nitrite is an indicator of ammonia (major constituent of landfill leachate) that has not been biologically processed (into nitrate). Nitrite levels above 3 mg/L are considered potentially harmful by the *2011 Australian Drinking Water Guidelines 6*.

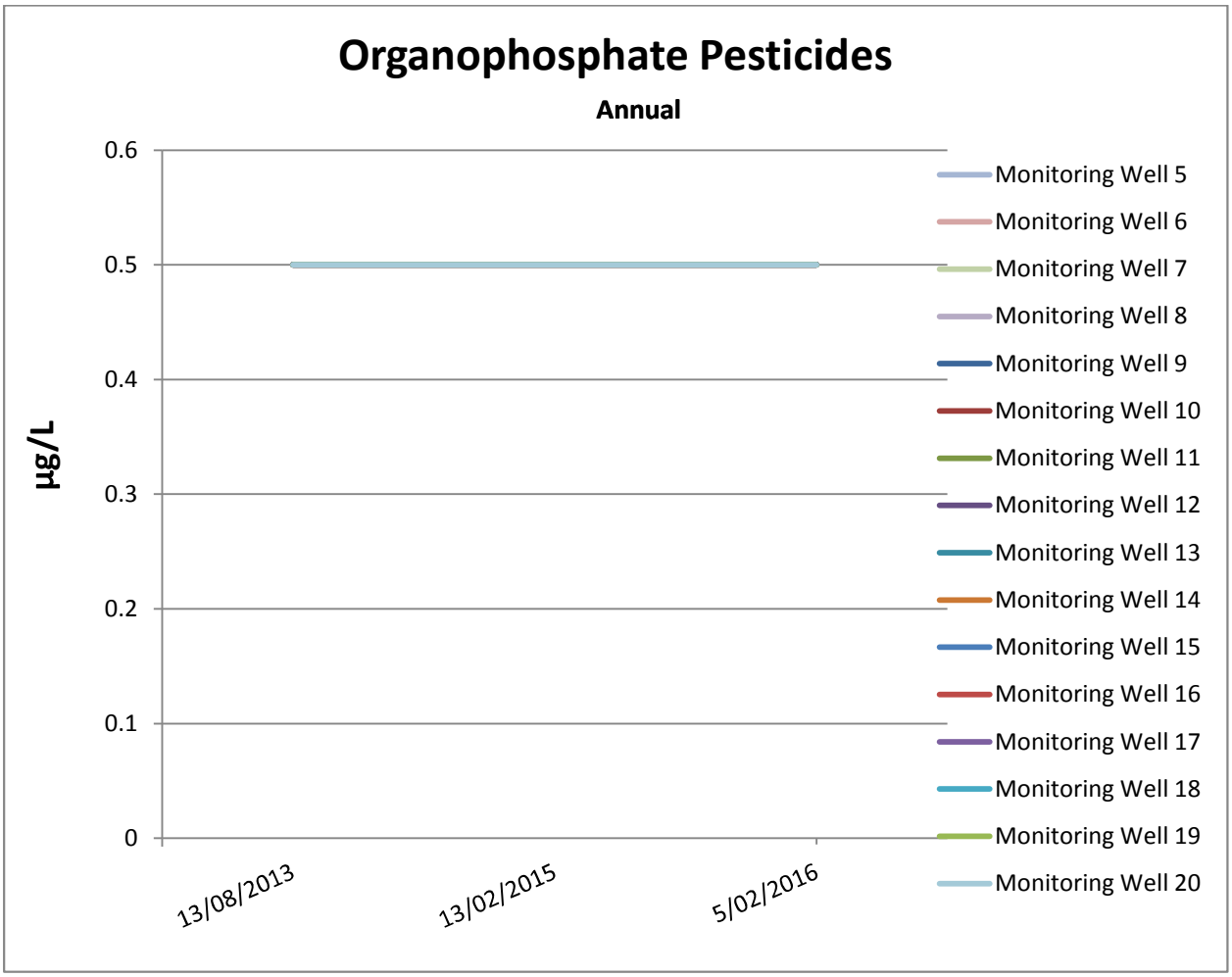
Nitrite levels found in the ground water monitoring wells are extremely small and below detectable limits in almost all of the samples taken. However, the slight increase in wells 17 and 19 should be carefully scrutinised during the next round of annual sampling.

Figure 3.2.4.17 Organochlorine Pesticides results presentation



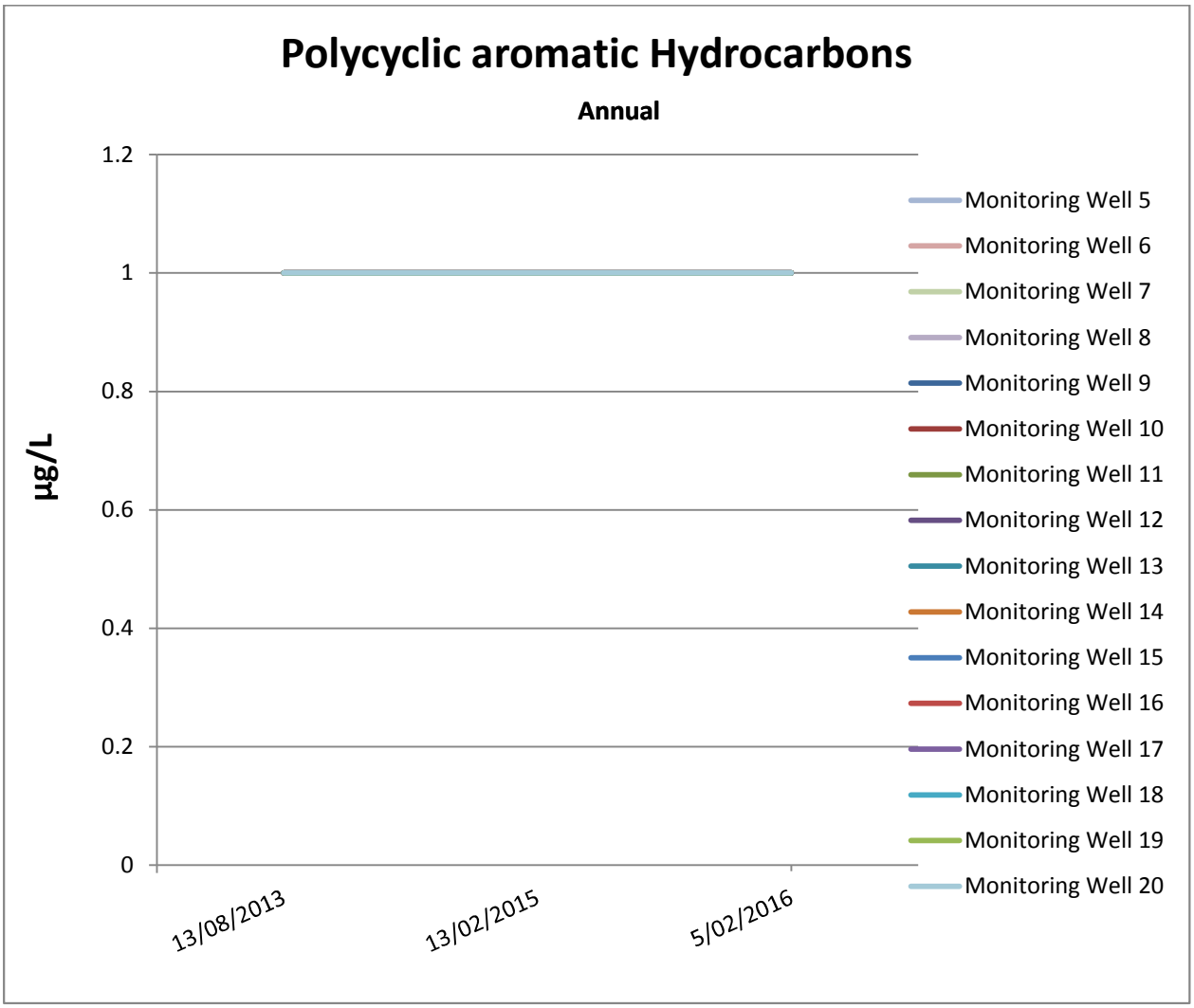
Organochlorine pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.18 Organophosphate Pesticides results presentation



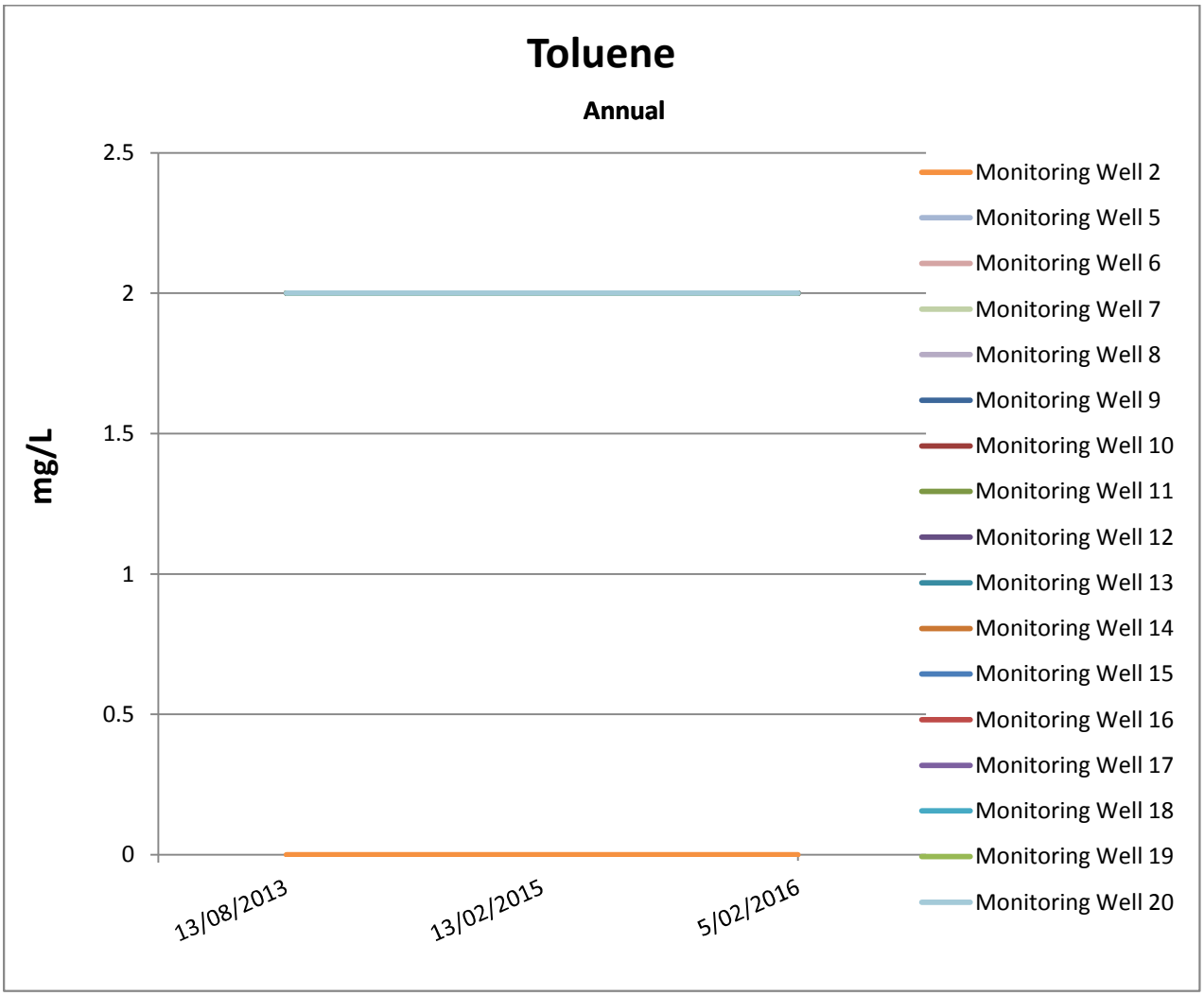
Organophosphate pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.19 Polycyclic Aromatic Hydrocarbons results presentation



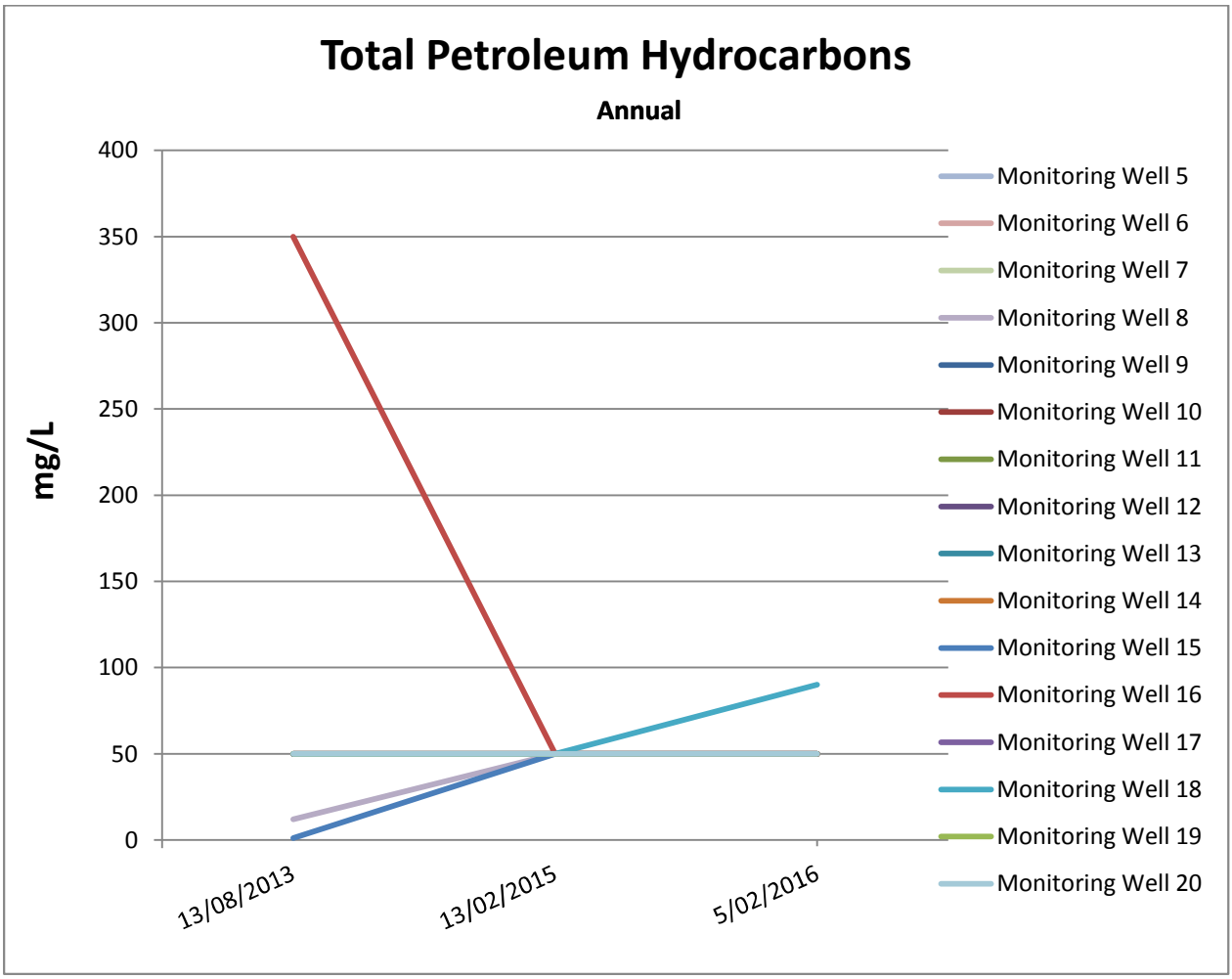
Polycyclic aromatic hydrocarbons were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.20 Toluene results presentation



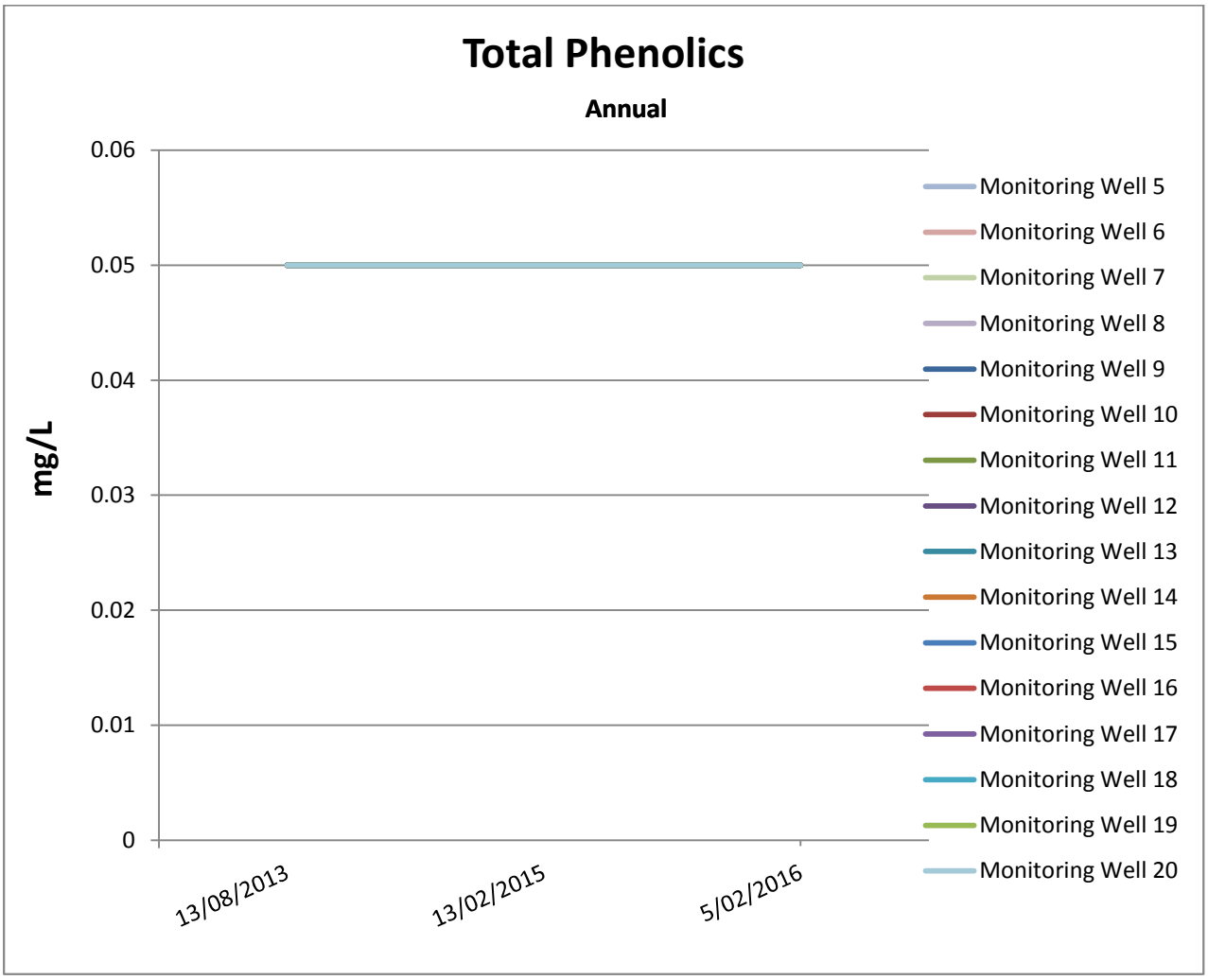
Toluene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.21 Total Petroleum Hydrocarbons results presentation



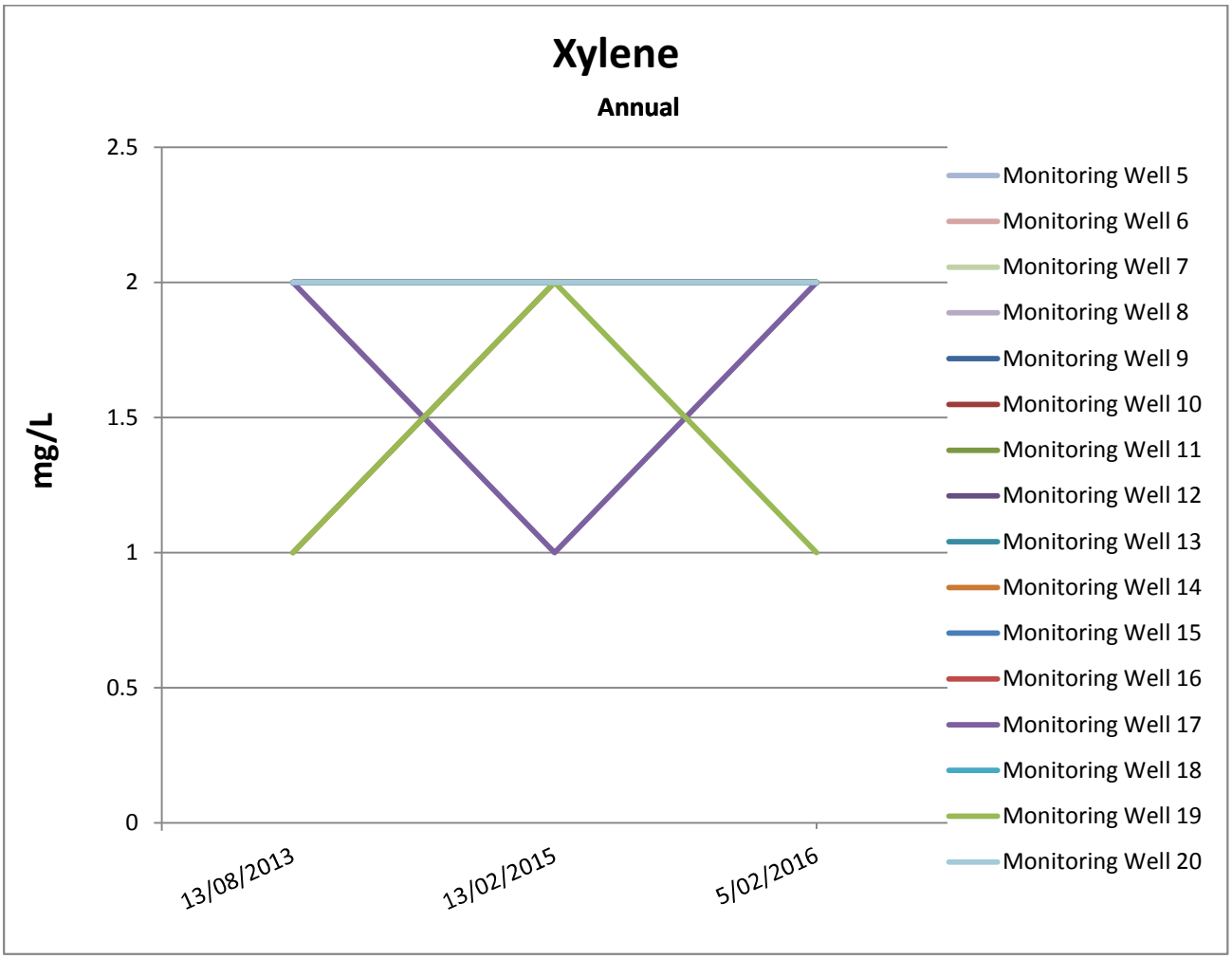
Total petroleum hydrocarbons are generally at concentrations below detectable limits in the monitoring wells. The initial spike in well 16 has since returned to low levels, whilst well 18 has exhibited a slight increase. Continued annual monitoring will help identify any continued trends.

Figure 3.2.4.22 Total Phenolics results presentation



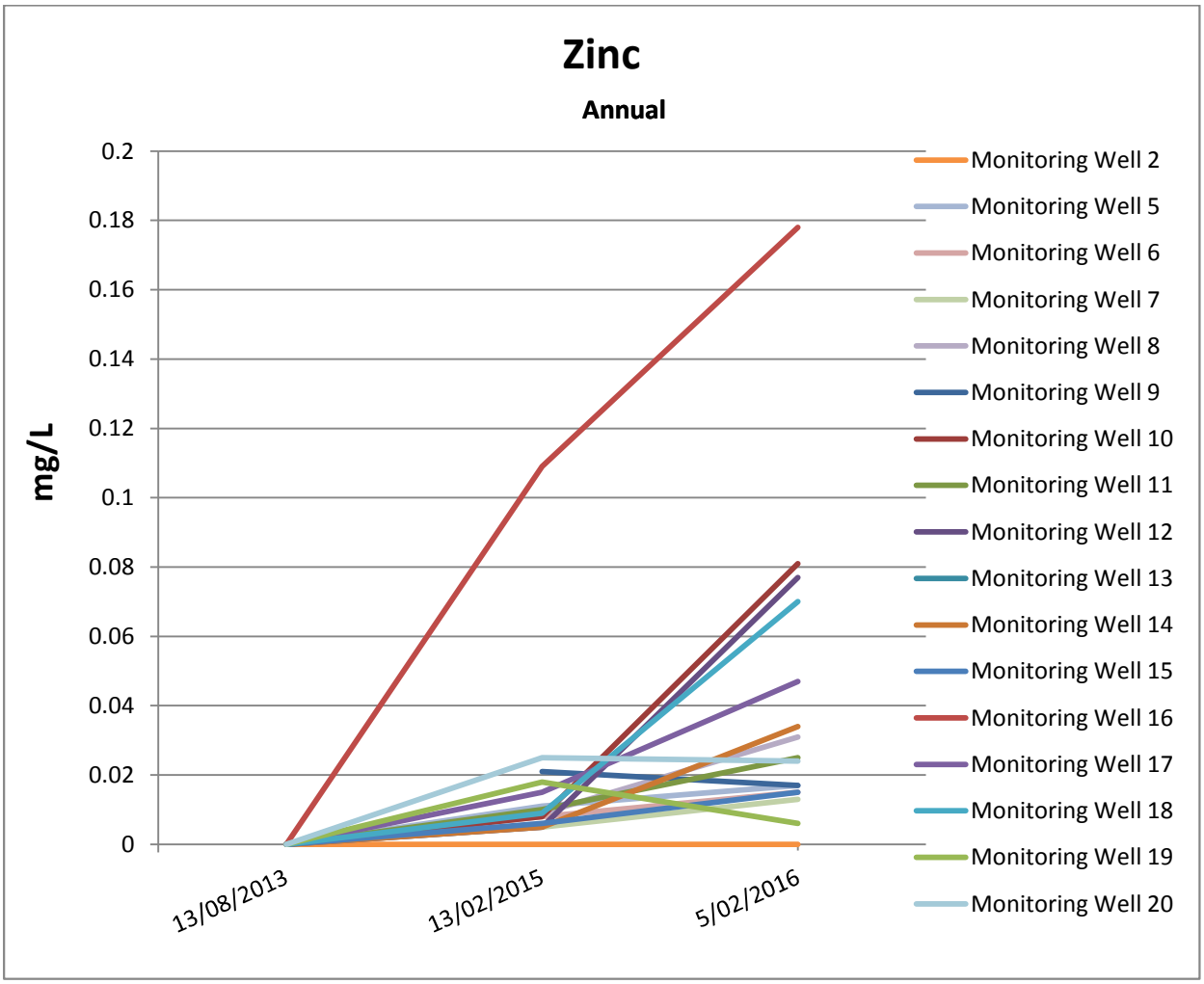
Total phenolics were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories.

Figure 3.2.4.23 Xylene results presentation



Xylene has not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. All results to date have been at concentrations below the limits detectable by laboratories. Only the inconsistency in the applied laboratory standard (Note: laboratory is NATA accredited) between 1 mg/L and 2 mg/L as prescribed detectable limits has changed.

Figure 3.2.4.24 Zinc results presentation



The *2011 Australian Drinking Water Guidelines 6* states that for aesthetic reasons a maximum of 3 mg/L of zinc is desirable for consumption. Landfill sites can be an anthropogenic source of zinc in groundwater, however despite the extremely low levels of zinc detected; monitoring well 16 should be further monitored in future annual sampling regimes due to the display of levels higher than the other surrounding points.

3.2.5 Groundwater Testing Results Interpretation

Results indicate that there has been no conclusive increase in concentration levels for any of the analytes detailed when compared to the historical results and trends. The following table indicates the analytes that should be closely monitored for developing trends at the next scheduled round of testing:

Table 3.2.5 Analytes that require closer scrutiny on future sampling

Analyte	Monitoring Point	Regime	Next Sample
Nitrogen (Ammonia)	16	Quarterly	August 2017
Aluminium	12	Annual	February 2017
Barium	16	Annual	February 2017
Cadmium	10	Annual	February 2017
Chromium (total)	12	Annual	February 2017
Cobalt	16	Annual	February 2017
Copper	10, 12	Annual	February 2017
Lead	12, 16, 18	Annual	February 2017
Manganese	16, 20	Annual	February 2017
Nitrate	12	Annual	February 2017
Nitrite	17, 19	Annual	February 2017
Total petroleum hydrocarbons	16	Annual	February 2017
Zinc	16	Annual	February 2017

On reflection, key indicators of landfill leachate's potential ingress into groundwater particularly ammonia, nitrate, nitrite levels and other less poignant indicators as tested do not conclude that that landfill leachate is entering the surrounding ground water system. However, the results presenting in monitoring wells 12 and 16 warrant continued scrutiny.

3.3 AIR EMISSIONS MONITORING

3.3.1 Tabulated Results

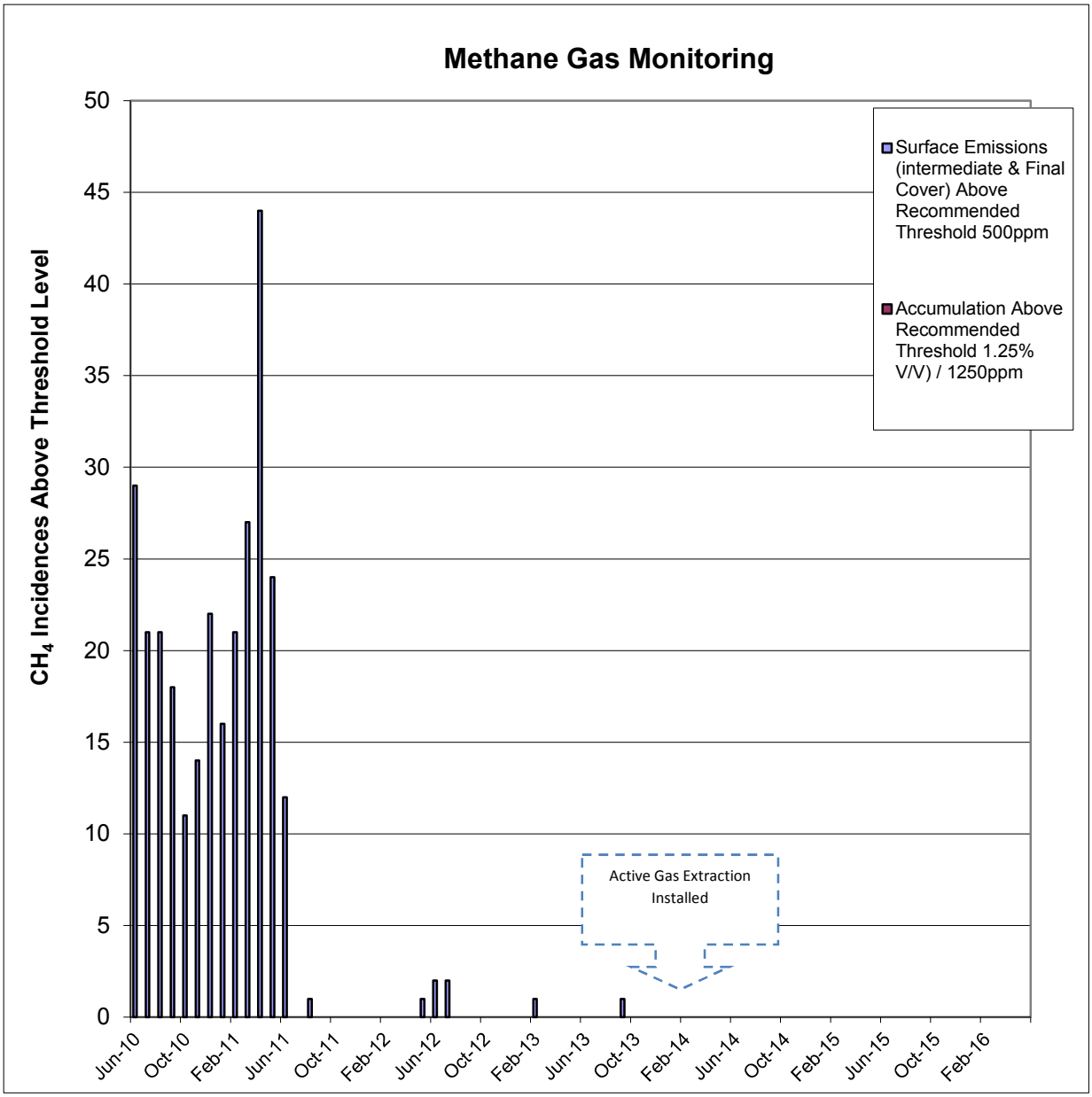
Table 3.3.1 Methane monitoring results for the reporting period

Date	Results Above Recommended Threshold 500ppm	Accumulation Above Recommended Threshold 1250ppm
Jun-15	0	0
Jul-15	0	0
Aug-15	0	0
Sep-15	0	0
Oct-15	0	0
Nov-15	0	0
Dec-15	0	0
Jan-16	0	0
Feb-16	0	0
Mar-16	0	0
Apr-16	0	0
May-16	0	0

The presented data describes the number (zero in the reporting period) of individual sample results derived from monthly testing that are above the EPA Benchmark Technique recommended threshold levels for further action regarding surface emissions (500 ppm) and accumulation levels (1,250 ppm).

3.3.2 Data Presentation

Figure 3.3.2 Air emissions test results above benchmark recommended threshold levels presentation



There is no evident trend for methane gas emissions from the landfill surface. No accumulation levels above the recommended benchmark threshold were found.

3.3.3 Air Emissions Monitoring Results Interpretation

During the period 2011-2012 results sampled by GHD showed continued occurrences of surface methane emissions above the EPA recommended threshold levels. A more recent contract awarded to a NATA approved laboratory (ALS Environmental) has shown that the GHD recorded levels were potentially overstated. Both companies state that the accumulation monitoring clearly shows that the methane is not migrating offsite.

Despite the differences in sample results, the site has the potential to generate relatively high amounts of landfill gas, namely methane that must be dealt with. Accordingly, Council commenced installation of methane gas extraction infrastructure in February 2014. Phase 1 (covering the older western gully) of the landfill gas management is in place and connected to a flaring unit. Phase 2 (capturing gas from legacy waste in under the new cell liner in eastern gully) has been fully constructed and has been commissioned. The final Phase 3 gas collection system will include infrastructure within the waste filling of the new landfill cell at the WWARRP. This project has been placed on hold due to the potential Council merger with Shellharbour City Council and the additional purchasing power that may present in procuring Phase 3 on behalf of both the Dunmore and Whytes Gully sites.

3.4 ENVIRONMENTAL COMPLAINTS

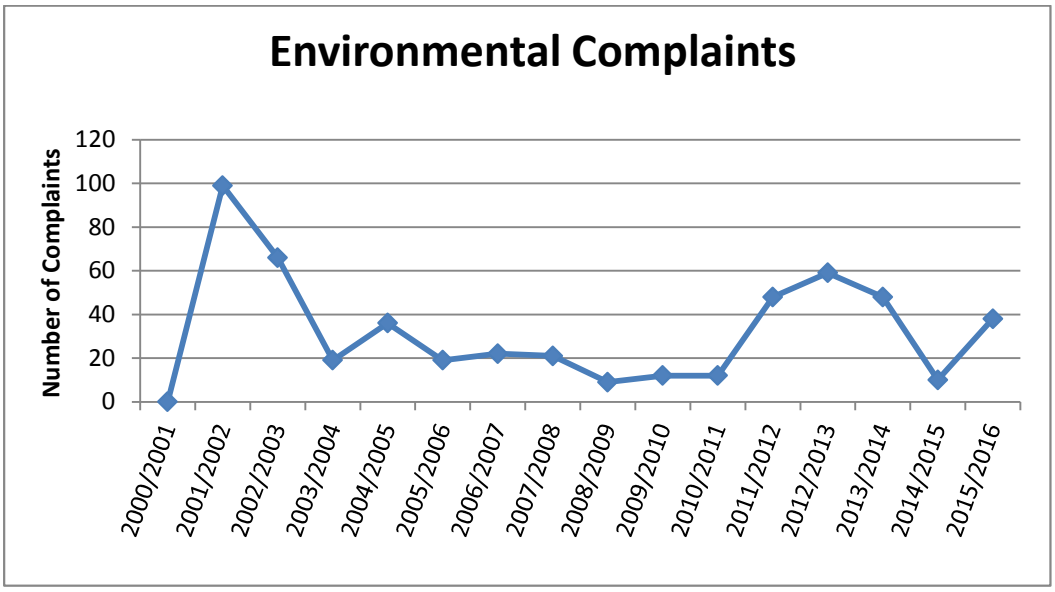
3.4.1 Tabulated Results

Table 3.4.1.1 Environmental complaints

Year	Environmental Complaints
2000/2001	0
2001/2002	99
2002/2003	66
2003/2004	19
2004/2005	36
2005/2006	19
2006/2007	22
2007/2008	21
2008/2009	9
2009/2010	12
2010/2011	12
2011/2012	48
2012/2013	59
2013/2014	48
2014/2015	10
2015/2016	38

3.4.2 Data Presentation

Figure 3.4.2.1 Environmental related complaints presentation

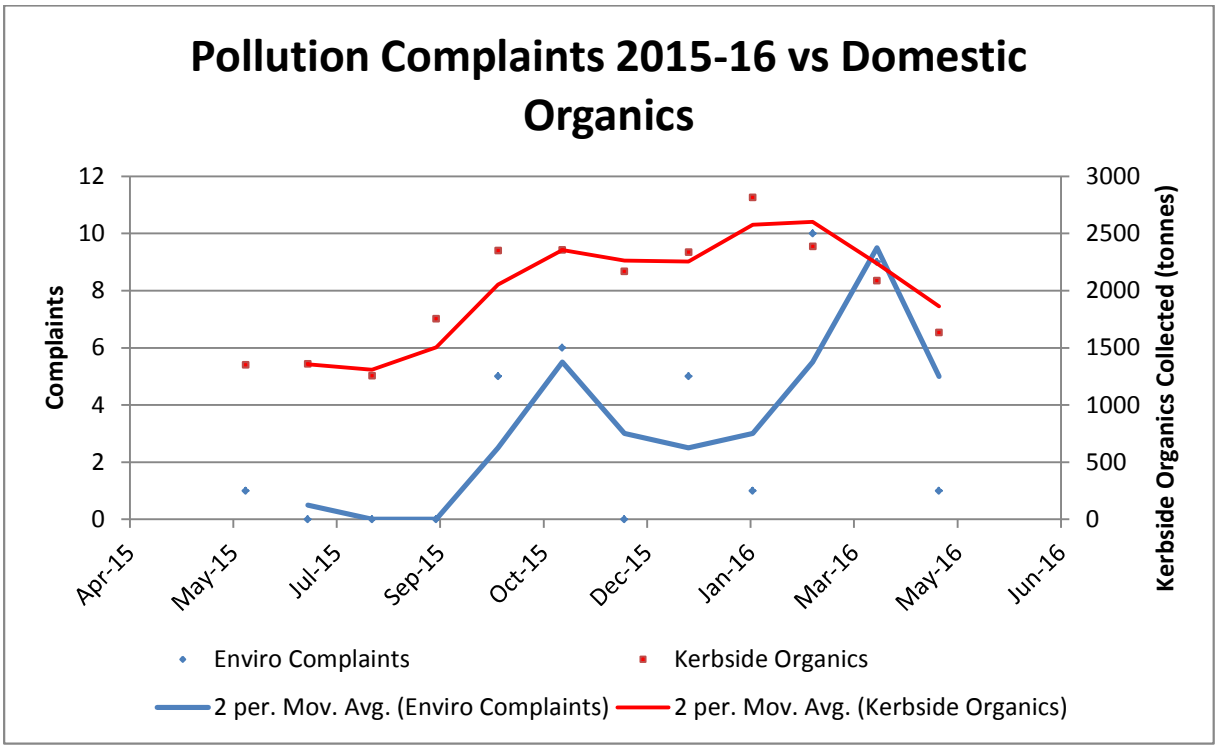


3.4.3 Environmental Complaints Results Interpretation

The overlying trend for environmental complaints had been downward after closure of the solid waste energy recovery facility in 2004. However, the reporting periods 2011/12 to 2013/14 have given rise to a spike of approximately 150 complaints, invariably regarding perceived odour from the WWARRP. It should be noted that Council commenced community engagement over a new landfill cell development at Whytes Gully coinciding with the 2011/12 year complaints spike.

The bulk of the complaints (almost 70%) conveyed in the reporting period have been received in the period January through April 2016. This coincides with historic timing for the highest number of complaints, which mirrors the highest volumes of kerbside collected green waste.

Figure 3.4.3.1 Pollution (odour) complaints compared to garden organics collection volumes



As demonstrated by the blue line in the Figure 3.4.3.1, the majority of complaints have been received during late summer and into the autumn season. This mirrors the red line which displays trend average volume of green waste collected from kerbside collections. Statistically, the data set for odour related complaints has a strong correlation value (r^2) of greater than +0.5 to the data set for the volume of domestic garden organics. This gives efficacy to the theory that garden organics are most often the source of odours detected by nearby residents.

From 01 July 2014, kerbside green waste not stored at the WWARRP, instead it is unloaded at a nearby site on Reddalls Road, which also accepts other Council area's green waste and food waste. Regardless of this, Wollongong City Council fully investigates all odour complaints received upon receipt of the complaint. An example of an Environment Incident Report completed as a result of complaints received in March 2016 can be found in Annexure B. The Environment Incident Report demonstrates the procedure Council uses to respond to environment complaints.

3.5 TRADE WASTEWATER RESULTS

As required in Clause M6.2 of the Sites EPL, the Trade Wastewater Results are tabulated below:

Table 3.5.1 Trade Wastewater Results May-Aug 2015

Analyte	Units	5-Jun	12-Jun	23-Jun	30-Jun	1-Jul	24-Jul	4-Aug	11-Aug	31-Aug	28-Aug
pH Start	Units	7.1	7.6	7.4	6.9	7.3	7.5	7.4	7.4	8	7.7
TDS	mg/L	3760	4090	3790	780	3520	4780	4720	5180	3070	3280
TSS	mg/L	62	30	95	5	52	38	109	35	99	96
Ammonia (N)	mg/L	1.3	0.8	0.6	13.6	0.8	0.3	1.9	2.2	4	0.8
pH Finish	Units	7.2	7.4	8.2	6.9	7.3	7.3	7.9	7.5	7.5	8.1
BOD	mg/L	57	23	16	15	11	20	16	16	8	37
Temp	^{o}C	12	15				16	11	14	16	

Table 3.5.2 Trade Wastewater Results Sep-Nov 2015

Analyte	Units	4-Sep	14-Sep	23-Sep	2-Oct	8-Oct	19-Oct	28-Oct	5-Oct	13-Nov	20-Nov
pH Start	Units	7.5	7.3	7.2	7.4	7.1	7	7.2	7.3	7.4	7.8
TDS	mg/L	3460	2780	2780	3060	3480	2890	3640	3710	4150	4370
TSS	mg/L	30	64	113	56	89	43	57	55	37	41
Ammonia (N)	mg/L	0.3	0.2	0.1	0.1	0.1	0.3	0.6	0.6	0.3	0.3
pH Finish	Units	7.5	7.2	7	7.1	7.2	6.9	7.4	7.2	7.3	7.5
BOD	mg/L	9	14	18	16	28	10	18	12	24	16
Temp	^{o}C	18	26	14	20	17	24	20	21	20	24

Table 3.5.3 Trade Wastewater Results Nov 15 –Feb 16

Analyte	Units	24-Nov	3-Dec	8-Dec	5-Jan	13-Jan	21-Jan	29-Jan	5-Feb	15-Feb	24-Feb
pH Start	Units	7.4	7.1	7.2	7.6	7.1	7.2	7.1	7.2	7.4	7.5
TDS	mg/L	4060	4830	5000	5090	4020	4020	3750	3820	4060	4190
TSS	mg/L	34	30	45	81	29	45	52	40	28	38
Ammonia (N)	mg/L	0.2	0.6	0.3	5.4	0.2	0.1	0.3	0.1	2.6	0.3
pH Finish	Units	7.5	7.1	7.8	6.9	7.3	7.3	7.2	7.5	7.4	7.6
BOD	mg/L	9	8	4	20	69	7	9	9	10	17
Temp	^{o}C	28	28	24	24	28	31	27	25	27	28

Table 3.5.4 Trade Wastewater Results Mar –May 16

Analyte	Units	4-Mar	11-Mar	20-Mar	29-Mar	8-Apr	22-Apr	3-May	18-May	26-May	4-Jun
pH Start	Units	7.3	7.4	8	7.5	7.2	7.3	7.2	7.5	7	7.3
TDS	mg/L	4090	4310	4260	3890	4050	4510	5430	5490	5890	4090
TSS	mg/L	39	23	22	56	36	28	28	44	34	39
Ammonia (N)	mg/L	77.9	0.8	2.5	6.6	0.8	0.1	0.02	1.7	3.3	77.9
pH Finish	Units	7.4	7.4	8.6	7.6	7.6		7.2	7	7.1	7.4
BOD	mg/L	60	12	6	23	2	6	8	3	21	60
Temp	^{o}C	33	28	24	25	20		19	20	15	33

4 SITE SUMMATION

4.1 DEFICIENCY IDENTIFICATION & REMEDIATION

4.1.1 Surface Water Overflow Result of 116 mg/L in August 2015

As presented in Section 3.1.4, the discharge of turbid water was caused by a heavy rainfall event in which the site was inundated with water. The major construction works relating to the new landfill cell development and associated infrastructure is understood to be a major contributor to the source of sediment in the control ponds. Additionally, the pond holding capacity was not at its optimal volume when the rainfall event took place.

Specifically, the water that exited the site contained suspended solids at levels above the 50 mg/L concentration limit prescribed in the sites Environment Protection Licence. Given that the entire catchment was visibly turbid and heavily laden with sediment at the time (both upstream and downstream samples taken at the same time indicated suspended solids approaching the 50 mg/L concentration limit) there was no material harm caused by the non-compliance (as defined by Section 147 of the POEO Act (1997)).

To help reduce the likelihood of future non compliances, a Wet Weather and Stormwater Management work instruction has been created and implemented to ensure that the sediment pond capacity is maintained between rainfall events. The Wet Weather and Stormwater Management work instruction is attached to this report in Annexure C.

4.1.2 Elevated Calcium, Chloride, Magnesium and Sulfate Levels in Sediment Pond Annual Sample March 2016

As discussed in Section 3.1.4, the March 2016 Annual Sample of the sediment pond displayed elevated calcium, chloride, magnesium and sulfate levels compared to the historic trends. The March sample was not an overflow event and therefore these elevated analytes did not exit the site. Three additional samples taken since March 2016 have all indicated that these analytes have returned to historic levels. Given the analytes as a group, the most common anthropogenic source is construction and building material. Therefore it is likely that the construction works taking place at Whytes Gully

have discharged some sediment laden water which has been captured in the sedimentation ponds (as per their design and function).

The help ensure that this is not repeated, Council now completes daily inspections of sediment control devices and infrastructure installed by construction crews on the Site.

4.1.2 Destruction of EPA Monitoring Point 2

Monitoring Point 2 is located in an operational area that is utilised for the Small Vehicle Transfer Station and organics receipt. The impractical location of well 2 has led to various vehicular interactions and consequential repairs over the years. However, the current damage to the well is such that it was unable to be sampled during the reporting period. The Monitoring Point is located south west of the old 'Western Gully' landfill cell and is situated to intercept ground water movement in a south westerly direction through the site. There are also additional sampling points to the south, south west and west of this monitoring point that also intercept south westerly ground water movement though the site. In lieu of the damaged bore, Council has used monitoring points 5, 11 and 18 to continue to monitor ground quality in this region.

In planning for the repair, it was identified that the location of monitoring well 2 will be further impacted by the new Haul Road construction commencing in 2016 and the associated stormwater drainage infrastructure. Council is currently reviewing the ongoing relevance of monitoring well 2. Given the proximity and location of the Monitoring Points 5, 11 and 18 preliminary expert advice suggests there is potential to remove this Monitoring Point altogether from the licence, or replace it at a nearby location. Council will progress this assessment as a priority and inform the EPA of the expert's determination.

4.1.3 Official Caution Incomplete and Inaccurate2013-14 Annual Return

Council received an Official Caution dated 21 March 2016 for failing to identify the 2013-14 issued penalty notices within the Statement of Compliance section of the 2013-14 Annual Return.

Council acknowledges the importance of accurate reporting in the Annual Returns and endeavours to provide true and complete records when submitting these documents. However, as identified by the EPA, on this occasion an error was made in the 2013-14 Annual Return stating nil non-compliance when in fact a penalty notice was received against licence condition O6.4 just prior to the end of the reporting period.

This error was in no way an attempt to conceal the non-compliance (note that the non-compliance was referred to inside the written portion of the Annual Report), nor there be any benefit in doing so as the penalties were made public through the local media and are also available to the public on the Environment Protection Authority's website

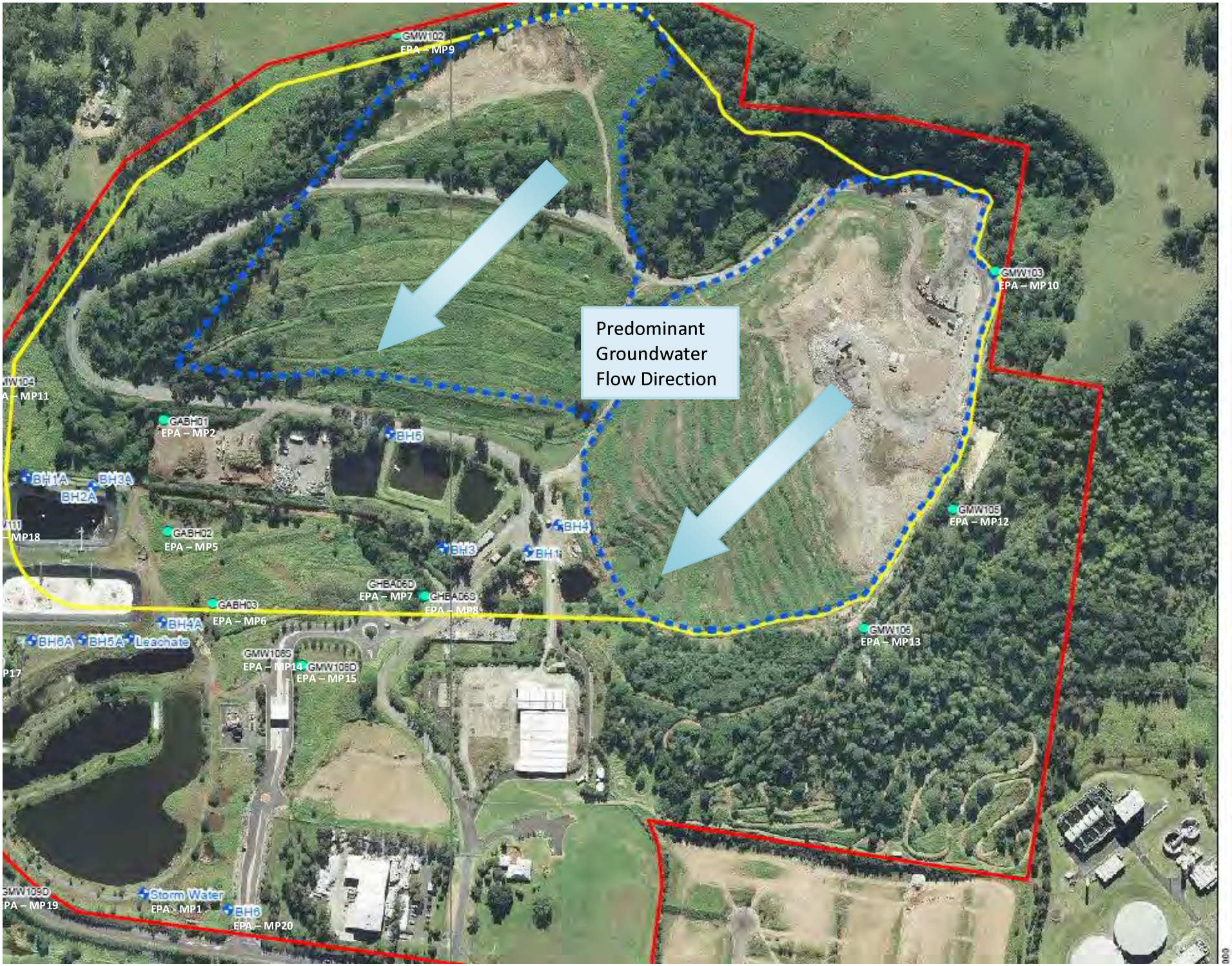
4.2 CONCLUSION

The site is performing well within the individual criteria and limits assigned to it in regard to environmental performance. The low number of deficiencies shows that Council has maintained satisfactory environmental performance. Actions have already commenced to improve the sites performance in regard to the identified deficiency in Section 4.1.1 and 4.1.3, which will ensure Council's goal of continuous environmental improvement at Whytes Gully is achieved.

Further, the modernised test regimes already implemented, along with the best practice multi redundancy lined new cell development will provide a far more sustainable environmental outcome for the surrounding environment. Observations made in this year's annual return indicate that the new landfill cell development is functioning well and as designed.

ANNEXURE A

Environmental Monitoring Locations



LEGEND

- Proposed Ground W
- Existing Monitoring L
- Approximate Extent
- Extent of Landfill Wo
- Site Boundary

NOTES

Extent of waste based on site ob
provided by Council.

Aerial Ortho-Photograph provide
16 May 2011, Reference 18763A

Extent of landfill works as per Go

Investigation locations surveyed

0 25 50 100

SCALE (at A3) 1:4,0

Coordinate System: GDA 1994 M

PROJECT:	11762500
DATE:	26/03/201
DRAWN:	FA'
CHECKED:	JMc

ANNEXURE B

Example Environmental Incident Report

ENVIRONMENTAL INCIDENT REPORT - (1)

Complete this form for all environmental incidents that occur at or on Wollongong City Council worksites.

MATERIAL HARM INCIDENTS MUST BE REPORTED TO 5 ESSENTIAL AGENCIES IMMEDIATELY

(i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

(ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and

(iii) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment

The purpose of this form (1) is to alert Waste Service to potential environmental incidents. It does not represent Wollongong City Council's final position for any incident reported on this form.

Remember!	Complete all fields prior to submitting form Be succinct, stick to the facts and **do not** make assumptions Only record information you know to be correct

Incident Details

DATE:	22-3-2016	TIME:	Between 6.00am-1.30pm	Duration: 7.5hrs – odour profile varied	TRIM: PATHWAY: 507754, 507765, 507768, 507770, 507771, 507773, 507774

Description (provide a brief description of what happened during the incident (**MATERIAL HARM INCIDENT - 5 ESSENTIAL AGENCIES MUST BE NOTIFIED IMMEDIATELY)**	507754 - After hours call Ref 126132. Garbage odour in air. Has been there for past few days. Caller feels like vomiting. Ongoing issue. Odour started on Tuesday at approx 8.10am.
	507765 - The caller was advised to call Environment line by Council. Caller has been affected by a rotten refuse odour intermittently over several years but didn't know where to complain about the problem. The caller was affected by the odour at a strong level yesterday at about 6:45am. The odour occurred again this morning, though not quite as strong in intensity. The odour has abated since earlier this morning. Caller unsure of wind direction.
	507768 - After hours call Ref 126135: Odour coming from a waste facility. Odour was noticed at about 08:15 on 22/3/16. Coming into the dining room and through the house.
	507770 - Caller affected by a strong rotten refuse odour, it was extremely strong early in the morning, still quite bad at about 8:30. The odour is still present at time of call but not as strong. The odour was also present on the weekend mornings.
	507771 - Very strong garbage odours coming from Whytes Gully Waste Disposal Facility, Reddalls Rd, Farmborough Heights. Very strong garbage odours on Sunday morning 20/3/16 at 8:30am & today 22/3/16 at 7:30am, caller rated the strength of the odours as 5 very strong and said they had to stay indoors and close the house.
	507773 - The smell at 11:30 is like a "chemically treated smell" but fairly sure it is rotting green waste. It's not the same as the "dump odour" that he smelled earlier this morning. The weather today is windy, wind from the South, and the odour is about 4/6 in strength.
	507774 - Caller was affected by a strong rotten refuse odour, it infiltrated the home, and was extremely strong when outdoors. The odour had abated by about 10am. The caller believes that the Whytes gully waste facility was the source of

	the odour.
EXACT location of the incident (include chainage, landmarks, features, nearest cross street) – provide a sketch if appropriate	Fairloch Ave, Loch Carron Ave, Aberdare Place, Highview Place, all Farmborough Heights
Quantity or volume of material discharged or affected by incident (provide estimate if quantity is unknown)	N/A
Estimated distance to nearest waterway. This can include stormwater drains and dry watercourses. (where relevant)	N/A
Type of activity that caused incident (what works were in progress at the time of the incident?)	Usual Waste Operations Wollongong Resource and Recovery Park. Development Site west of Waste facility excavating organic matter reported to EPA at11.40 am, EPA to investigate separately. Strong Odour Reported by Weighbridge staff and contractors on site at Waste Facility to Waste Services Coordinator.
How was the incident identified? (eg employee, Contractor, community, complaint)	Community complaint to EPA Environment Line.
Name and contact details of complainant (where relevant)	EPA
Address of complainant	Anonymous
If Odour, describe complainants description of odour, What does it smell like? Intensity: 0 No odour 1 Very faint odour 2 Faint odour 3 Distinct odour 4 Strong odour 5 Very Strong odour	Odour Intensity: ☐1 ☐ 2 ☐ 3 ☐ 4 ☒ 5
Describe weather conditions at the time Temperature(very warm, warm, mild, cold) Wind Strength (none, light, steady, strong, gusting) Wind Direction (eg from NE)	Mild temperature 17.6 to 20.6 Wind Direction SSW 8.2 Km/h Little rain overnight
Describe weather conditions during recent weeks Temperature(very warm, warm, mild, cold) Wind Strength (none, light, steady, strong, gusting) Wind Direction (eg from NE)	Mild Temperature avg 22.6 5.4 Km/h avg wind speed 20.4 mm Rain last 22 Days

Any other details of the incident (including any information which did not fit in spaces above, as well as any special circumstances of the day or the location)

Strong Odour Reported by Weighbridge staff Waste Facility to Waste Services Coordinator during morning of 22 March 2016. Unable to detect the source of the strong odour onsite at WWARRP. Operations (i.e. lifting the lids) didn't commence onsite until after 7.30am.
Investigated development site west of facility at 11.30 am strong rotting organic –vegetation smell .Observed several excavators loading dump trucks with loose/sloppy material on adjacent site. Wind direction from the SW towards Waste Facility. Interviewed Contractor s on site at Waste facility they confirmed rotting vegetation smell during morning of complaint. Investigate Waste fill area some waste smell but nothing unusual to normal daily operations. See photos bellow. Refer to attached wind correlation map for further information.
Investigated complaint areas at Farmborough Heights, no odour detected between 11.40am and 12.30 pm Wind speed increased and changed direction to SE.

What immediate actions/control measures were taken to rectify or contain the incident?

Sourcing extra cover material on site in addition to usual cover material and land fill covers.
Monitor odour on site and Farmborough Heights in the immediate future.
Staff advised not to 'pull back' cover tomorrow morning to reduce the chance of odour being released.

What corrective action has been taken to prevent similar incidents recurring?

Reinforce opening procedure to minimise impact.
Waste Coordinator and Waste Operations Manager attended Farmborough Heights at 7.10 am 23 March 2016 – nil odour detected. Staff then perform checks of the WWARRP site. WOM went to the top of the WWARRP site and waited until the lids had been lifted to detect any odour. None present this morning.
No excavation works visible on development site today 23/3/16 in the area the wet material was seen being loaded yesterday.
Odour management study being commissioned.
WCC has also become aware the Shellharbour City Council are preparing to take their FOGO (Food Organics/ Garden Organics) to Soilco at Kembla Grange until such time that their FOGO facility is constructed at Dunmore commencing 1 July 2016. It is anticipated that this will increase odour complaints in the Kembla Grange and Farmborough Heights areas.

Incident Category

Potential Category 1 Incident (may involve one or more of the following (tick incident type)	
☒ Material, odour or noise that travels beyond site boundary causing or potentially causing adverse impact to the environment or community	☐ Unauthorised harm or damage to threatened species, endangered populations, endangered ecological communities or critical habitat.
☐ Discharge of waters from site not in accordance with any applicable REF determination/approval/environment protection licence condition	☐ Unauthorised harm or damage to threatened aquatic species and protected marine vegetation or unauthorised dredging of reclamation works within a watercourse.
☐ A fire that travels beyond site boundary	☐ Unauthorised damage or destruction to any State or locally significant relic or Heritage item
☐ Unauthorised harm or desecration to Aboriginal objects and Aboriginal places	☐ Material harm to the environment or persons as per Part 5.7 of POEO Act (including harm on site)
☐ Failure to comply with a REF determination/approval/environment protection licence condition.	☐ Works undertaken without required approval or environmental assessment.

Potential Category 2 Incident (may involve one or more of the following (tick incident type)	
☐ Failure to implement component of Environment Management Plan that does not result in a Category 1 incident	☐ Spills that do not leave the site boundary and are cleaned up without material environmental harm or residual environmental impact.
☐ A fire contained on site without causing impact to the environment	

Sign-Off (person making report)

Print Name: Brock Heycott	Sign: B Heycott
Position: Waste Services Coordinator	Date: 22.3.2016

Notification to the <u>5 Essential Agencies</u> (where material harm identified <u>notify immediately</u>)

To be completed by the relevant Manager or delegated authority

Were relevant authorities notified under part 5.7 of POEO Act?

Authority	**Number**			**Date and Time Notified**
Fire and Rescue	000	☐ Yes	☐ No	n/a
Wollongong City Council	4227 7111	☐ Yes	☐ No	n/a
EPA NSW	131 555	☐ Yes	☐ No	n/a
The Ministry of Health	4222 5000	☐ Yes	☐ No	n/a
WorkCover Authority	13 10 50	☐ Yes	☐ No	n/a

Fire and Rescue	1300 729 579	☐ Yes	☐ No	n/a
Department of Planning	4224 9450	☐ Yes	☐ No	n/a

Surrounding Land Holders (if necessary)	Refer to Pollution Incident Response Management Plan (PIRMP) for contacts	☐ Yes	☐ No	n/a

Who notified the EPA?
Name: Sandra Belanszky Position: Waste Operations Manager

Notification Method ☒ Phone (and email) ☐ on site	Date	22/3/16	Time	Various ☒ am ☒ pm

Has there been a EPA Environmental Line Complaint? ☒ Yes ☐ No	EPA Complaint No: I04328-2016, I04340-2016, I04324-2016, I04325-2016, I04316-2016, I04311-2016, I04321-2016

Authorities notified and why: (eg Essential Agencies and Neighbouring properties) Nil

Sign off (Manager/delegated authority officer)

Print Name: Sandra Belanszky	Sign: S Belanszky
Position: Waste Operations Manager	Date: 23.3.2016

Z15/38744

***ANNEXURE** C*

Wet Weather & Stormwater Management Work Instruction

1.0 PURPOSE AND SCOPE

The purpose of this work instruction is to describe the way in which wet weather monitoring and storm water management is carried out on Council's Waste Sites:

- The Wollongong Waste and Resource Recovery Park (Whytes Gully)

2.0 DEFINITIONS/REFERENCES

The following references may be consulted if required;

- Whytes Gully Licence Number 5862 under Section 55 of the Protection of the Environment Operations Act 1997 (see http://www.epa.nsw.gov.au/prpoeoapp/ and enter licence number 5862 for the latest version)
- Whytes Gully Consent to discharge trade waste - Agreement No 11205 (TRIM Ref Z16/149009)
- Whytes Gully LEMP September 2014 Report No: 117625003_061_R_Rev2 (TRIM Ref Z12/221925)

3.0 INSTRUCTION DETAILS

3.1 GENERAL DESCRIPTION OF STORMWATER MANAGEMENT

3.1.1 Storm runoff water is collected into three dams (see Figure 2 below). Water in the dams should be kept below 50% capacity to enable sufficient storage capacity to handle runoff from most rainfall events and thus minimise the potential for uncontrolled discharges.

Warning: To avoid environmental harm no release is to occur to the external stormwater system until Council's Environment Officer (or nominated representative) has tested the water and confirmed that it is suitable for release. A record of the test must to be retained on file.

3.1.2 After cessation of inflow from a rainfall event, stored water in all three dams is allowed to settle. Dams may require expedited treatment through the use of gypsum dosing to bring the turbidity down to levels suitable for release to the external storm water system. The water may also need to be treated with acid or caustic to ensure pH is within range.

3.1.3 When testing shows that the water quality of a dam meets Environment Protection Licence conditions for release, it may be released to the creek at a rate not exceeding 1,000 m^3 /day (or 1 ML /day) until the water level is returned below 50% capacity.

3.1.4 Water remaining in the dams after cessation of the rainfall event may be managed/utilised as follows:

- dust suppression
- used for on-site irrigation

3.1.5 When an overflow event occurs during rainfall, sampling must be carried out by a Council's Waste Operations Manager (or nominated representative) at discharge points numbered 1, 4 and 6 on Figure 2 at a frequency of no less than one sample per day.

Note: Point numbers 1, 4 and 6 on Figure 2 represent the Environment Protection Licence Identification Numbers displayed in Table 1:

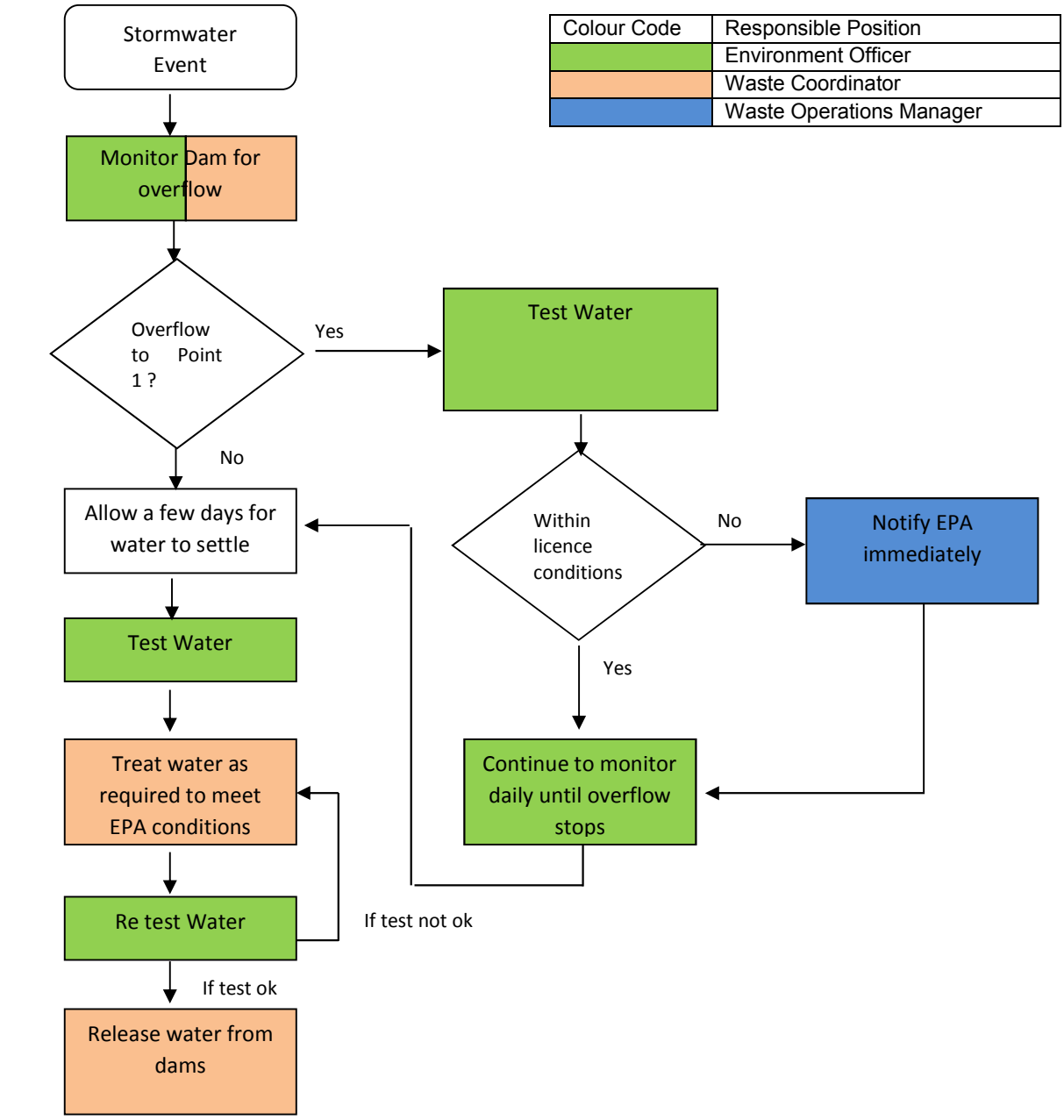
Table 1 Key Environment Protection Licence Identification Numbers

Figure 2 No.	EPL No.	Comment
1	1	Source
4	33	Downstream
6	34	Upstream

3.1.6 The samples are tested for compliance against the parameters specified in the Environment Protection Licence 5862. Where there is an exceedance of licence conditions, Council's Waste Operations Manager (or delegated representative) is to notify the EPA immediately.

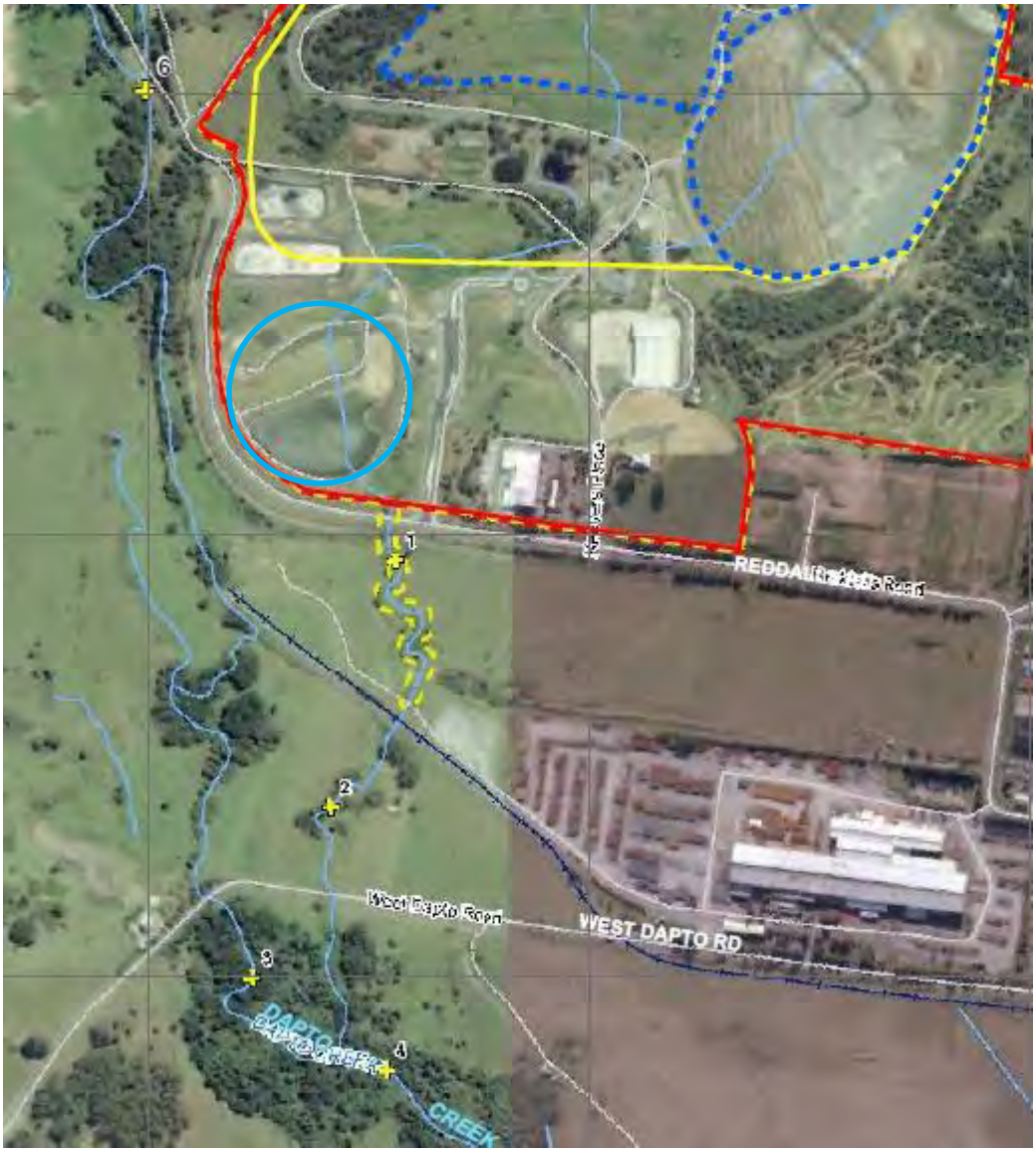
3.1.7 Where the samples are collected by the site Environmental Officer (or nominated Council representative) the Laboratory Submission Cover Sheet in Appendix 4.1 should be filled in and retained on file.

Figure 1 Stormwater Management Process



Note: Treatment will be by gypsum dosing to reduce suspended solids

Figure 2: Location monitoring points



3.2 RESPONSIBILITIES

3.2.1 For each rainfall event the Environmental Officer and Site Coordinator (or delegate) shall monitor the dam levels to establish if there is an overflow condition. Where an overflow condition occurs, the Environmental Officer (or delegate) notifies contracted sampler or the environmental representative who will in turn arrange for samples from monitoring points 1, 4 and 6.

3.2.2 Controlled release of water to creek is carried out by Council under the direction of the Operations Manager. The Operations Manager is responsible to ensure that appropriate testing is conducted and that the water quality falls within EPA guidelines before a controlled release occurs.

3.2.3 Council will be required to chemically dose dams using gypsum (dosage varies with sediment load, but dose average is 32kg/100m^3). The Site Coordinator will arrange for a suitably trained person to carry out this work.

3.2.4 Council is responsible for the supply of all chemicals required to treat storm water. The Waste Coordinator (or delegate) is required to monitor the stock of chemicals on site and record their use and replace stocks. The Environment Officer will ensure that all chemicals are listed on the hazardous chemicals register, MSDS are available on site for all chemicals, and that staff using the chemicals have been appropriately trained in their safe handling prior to use.

3.2.5 All major site drainage works such as stormwater ponds, dams, bund, drains, sediment retention traps, screens and erosion controls will be constructed by in accordance with relevant requirements (Refer appendices for construction methods). The Waste Coordinator is responsible for the operation and maintenance of the storm water management infrastructure which includes:

- Maintaining in a litter free condition
- Desilt & repair on an as required basis
- Maintain in a peak functional condition in accordance with design capacity
- Ensure that drainage occurs in a manner which prevents ponding and minimises erosion/scouring

3.2.6 All temporary drains will generally be earthen drains constructed at grades not steeper than 1%, to minimise scouring. Where steeper grades are required, the drains must be provided with appropriate scour protection, for example hay bales or rubble. All earthen drains will be grassed to minimise erosion.

<u>Warning:</u> A life buoy and throw rope is required when working in or around the dams in case someone slips or falls into the dam.

4.0 APPENDICES

4.1 Laboratory Submission Sheet

4.2 Construction of Drains on Outside of Batter

4.3 Construction of Drainage Channels

4.4 Typical Erosion Control Structure

4.5 Stormwater Treatment Plant

Wollongong City Council
City Works and Services Division – Waste Services
Laboratory Submission Sheet

Location/Site	Wollongong Waste and Resource Recovery Park (Whytes Gully)
Laboratory	ALS – Contract T
Purchase Order	
Sample Number	
Period Sampled	
Date Dispatched	

Dust Analysis Suite (Select One)

Selection	Test Type	Analytes/Results Required
☐	Monthly Dust	Total Insoluble Solids
☐	Other	Specify

Water Analysis Suite (Select One) (Note: All results in milligrams per litre unless specified)

Selection	Test Type	Analytes/Results Required
☐	Sediment Basin Discharge	pH, Total Suspended Solids.
☐	Surface Water Annual	Alkalinity (as Calcium Carbonate), Ammonia, Calcium, Chloride, Conductivity (µS/cm), Dissolved Oxygen, Filterable Iron, Fluoride, Magnesium, Nitrate, pH, Potassium, Sodium, Sulfate, Temperature (^{o}C), Total Organic Carbon , Total Phenolics and Total Suspended Solids.
☐	Quarterly Ground Water	Alkalinity (as Calcium Carbonate), Calcium, Chloride, Conductivity (µS/cm), Magnesium, Nitrogen (Ammonia), pH, Potassium, Sodium, Standing Water Level (m), Sulfate, Total Dissolved Solids and Total Organic Carbon
☐	Annual Ground Water	Aluminium, Arsenic, Barium, Benzene, Bicarbonate, Cadmium, Chromium (Hexavalent), Chromium (Total), Cobalt, Copper, Ethyl Benzene, Fluoride, Lead, Manganese, Mercury, Nitrate, Nitrite, Organochlorine Pesticides, Organophosphate pesticides, Polycyclic Aromatic Hydrocarbons, Toluene, Total Petroleum Hydrocarbons, Total Phenolics, Xylene and Zinc.
☐	Trade Waste (22 Days)	Ammonia, Biochemical Oxygen Demand, Suspended Solids, Temperature (^{o}C), Total Dissolved Solids, pH.
☐	Other	Specify

Special Instructions: Certified report required. All work to be undertaken to a current accredited testing method.

Contact	Signed	Name

ANNEXURE D

Annual Return 2014 - 2015

ANNUAL RETURN

LICENCE NO	**5862**
LICENCE HOLDER	WOLLONGONG CITY COUNCIL
REPORTING PERIOD	29-May-2015 to 28-May-2016

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual Return relates below:

REVISED REPORTING PERIOD _____ / _____ / _____ to _____ / _____ / _____

(Note: the revised reporting period also needs to be entered in Section E)

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 28-Jul-2016

Your Annual Return must be completed, including certification in Section I, and submitted to the EPA no later than 60 Days after the end of the reporting period for your licence.

Failure to submit this Annual Return within 60 days after the reporting period ends may result in:

- **the issue of a Penalty Notice for $1500 (individuals) or $3000 (corporations);**

OR

- **prosecution.**

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

THERE IS A MAXIMUM PENALTY OF $250,000 FOR A CORPORATION OR $120,000 FOR AN INDIVIDUAL.

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997.*

Use the checklist below to ensure that you have completed your Annual Return correctly.
(✓ the boxes)

CHECKLIST		
☑	Section A:	All licence details are correct
☑	Section B1:	You have entered the correct number in the complaints table
☑	Section B2 – B3:	If there are tables, you have provided the required details
☑	Section C:	You have answered question 1, and 2 if applicable
☑	Section D:	If applicable, you have completed all load calculation worksheets
☑	Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☑	Section F:	You have answered question 1, 2 and 3 if applicable
☑	Section G:	You have answered question 1 and questions 2, 3 and 4 or questions 5 through to 11 if applicable
☑	Section H:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☑	Section I:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
☑	Make a copy of the completed Annual Return and keep it with your licence records	
☑	Attach a cheque (unless you have paid separately) for the payment of the administrative fee for the next licence fee period PAID SEPARATELY	

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

A Statement of Compliance - Licence Details

ALL licence holders must check that the licence details in Section A are correct

If there are changes to any of these details**you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.**

Licence variation and transfer application forms are available on the EPA website at: http://www.epa.nsw.gov.au/licensing or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700.

If you are applying to vary or transfer your licence you must still complete this Annual Return.

A1 Licence Holder

Licence Number	5862
Licence Holder	WOLLONGONG CITY COUNCIL
Trading Name *(if applicable)*	
ABN	63 139 525 939

A2 Premises to which Licence Applies (if applicable)

Common Name (if any)	WHYTES GULLY WASTE DISPOSAL FACILITY
Premises	REDDALLS ROAD KEMBLA GRANGE NSW 2526

A3 Activities to which Licence Applies

Waste disposal (application to land)

A4 Other Activities (if applicable)

A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Waste disposal by application to land		capacity

A6 Assessable Pollutants (Not Applicable)

B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

Number of complaints recorded by the licensee during the reporting period. **If no complaints were received enter nil in the attached box, otherwise complete the table below.**	38

Pollution Complaint Category	Number of Complaints
Air	38
Water	
Noise	
Waste	
Other	

B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is **not** required by your licence, **no tables** will appear below.
Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Discharge & Monitoring Point 1

Stormwater monitoring and discharge point, Outlet at Reddalls Road - Monitoring point labelled 1 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297777 N6183972

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	3	3	129	259-33	455

Ammonia	milligrams per litre	3	3	0·1	0·75	1-92
Calcium	milligrams per litre	3	3	24	81-33	190
Chloride	milligrams per litre	3	3	37	270·67	649
Conductivity	microsiemens per centimetre	3	3	508	1465·67	3060
Dissolved Oxygen	milligrams per litre	3	3	2-99	6-85	9-46
Filterable iron	milligrams per litre	3	3	<0·05	0·10	0·19
Fluoride	milligrams per litre	3	3	0-3	0-4	0·5
Magnesium	milligrams per litre	3	3	14	45·67	102
Nitrate	milligrams per litre	3	3	0·29	1-12	2·62
pH	pH	3	3	7-6	7-93	8·2
Potassium	milligrams per litre	3	3	12	14-33	17
Sodium	milligrams per litre	3	3	58	174·00	342
Sulfate	milligrams per litre	3	3	20	55·33	114
Temperature	degrees Celsius	3	3	13-7	19-63	24
Total organic carbon	milligrams per litre	3	3	11	13	16
Total Phenolics	milligrams per litre	3	3	<0-05	<0-05	<0-05

Total suspended solids	milligrams per litre	3	3	18	75-67	116

Monitoring Point 2

Groundwater quality monitoring, Monitoring point labelled GABH01 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297751.8 N6184474

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre					
Aluminium	milligrams per litre					
Arsenic	milligrams per litre					
Barium	milligrams per litre					
Benzene	milligrams per litre					
Cadmium	milligrams per litre					
Calcium	milligrams per litre					
Chloride	milligrams per litre					
Chromium (hexavalent)	milligrams per litre					
Chromium (total)	milligrams per litre					
Cobalt	milligrams per litre					
Conductivity	microsiemens per centimetre					

Copper	milligrams per litre					
Ethyl benzene	micrograms per litre					
Fluoride	milligrams per litre					
Lead	milligrams per litre					
Magnesium	milligrams per litre					
Manganese	micrograms per litre					
Mercury	milligrams per litre					
Nitrate	milligrams per litre					
Nitrite	milligrams per litre					
Nitrogen (ammonia)	milligrams per litre					
Organochlorine pesticides	milligrams per litre					
Organophosphate pesticides	milligrams per litre					
pH	pH					
Polycyclic aromatic hydrocarbons	milligrams per litre					
Potassium	milligrams per litre					
Sodium	milligrams per litre					

DESTROYED

Standing Water Level	metres					
Sulfate	milligrams per litre					
Toluene	milligrams per litre					
Total dissolved solids	milligrams per litre					
Total organic carbon	milligrams per litre					
Total petroleum hydrocarbons	milligrams per litre					
Total Phenolics	milligrams per litre					
Xylene	milligrams per litre					
Zinc	milligrams per kilogram					

DELETED

Monitoring Point 3

Surface gas monitoring, Areas where intermediate or final cover has been placed.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.01	5.55	157

Monitoring Point 4

Gas accumulation monitoring, Inside all buildings within 250 metres of deposited waste.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	12	12	0·25	1-91	3-10

Monitoring Point 5

Groundwater quality monitoring, Monitoring point labelled GABH02 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297754.9 N6184377

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	998	1072	1130
Aluminium	milligrams per litre	1	1	1100	1100	1100
Arsenic	milligrams per litre	1	1	<0·001	<0·001	<0·001
Barium	milligrams per litre	1	1	0·01	0·01	0·01
Benzene	milligrams per litre	1	1	<0·001	<0·001	<0·001
Cadmium	milligrams per litre	1	1	<0·0001	<0·0001	<0·0001
Calcium	milligrams per litre	4	4	290	306·5	340
Chloride	milligrams per litre	4	4	911	1025·25	1080
Chromium (hexavalent)	milligrams per litre	1	1	<0·01	<0·01	<0·01
Chromium (total)	milligrams per litre	1	1	0·002	0·002	0·002
Cobalt	milligrams per litre	1	1	<0·001	<0·001	<0·001
Conductivity	microsiemens per centimetre	4	4	5190	5362·5	5550

Copper	milligrams per litre	1	1	0.007	0.007	0.007
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.6	0.6	0.6
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	194	189	196
Manganese	micrograms per litre	1	1	50	50	50
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.015	0.03
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.6	6.675	6.8
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	2	2.75	3
Sodium	milligrams per litre	4	4	575	624-5	661

Standing Water Level	metres	4	4	4.85	4.9325	5.09
Sulfate	milligrams per litre	4	4	166	174.25	188
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	3310	3435	3490
Total organic carbon	milligrams per litre	4	4	1	5	9
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Zinc	milligrams per kilogram	1	1	0.017	0.017	0.017

Monitoring Point 6

Groundwater quality monitoring, Monitoring point labelled GABH03 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297793.8 N6184315

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	639	715.5	752
Aluminium	milligrams per litre	1	1	0.08	0.08	0.08
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.014	0.014	0.014

Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	0.0001	0.0001	0.0001
Calcium	milligrams per litre	4	4	327	360	383
Chloride	milligrams per litre	4	4	996	1149	1240
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.003	0.003	0.003
Conductivity	microsiemens per centimetre	4	4	5160	5372.5	5540
Copper	milligrams per litre	1	1	0.009	0.009	0.009
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	191	206	214
Manganese	micrograms per litre	1	1	428	428	428
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.00001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0175	0.03
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.6	6.85	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1.75	2
Sodium	milligrams per litre	4	4	497	510.5	533
Standing Water Level	metres	4	4	0.37	0.485	0.69
Sulfate	milligrams per litre	4	4	194	206.75	221
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	3450	3780	4140
Total organic carbon	milligrams per litre	4	4	1	3.25	4
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Zinc	milligrams per kilogram	1	1	0.015	0.015	0.015

Monitoring Point 7

Groundwater quality monitoring, Monitoring point labelled GABH06D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297975.6 N6184322

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	327	352.5	377
Aluminium	milligrams per litre	1	1	0.06	0.06	0.06
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.005	0.005	0.005
Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.001	<0.001	<0.001
Calcium	milligrams per litre	4	4	90	100	107
Chloride	milligrams per litre	4	4	464	543.5	584
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	2780	2802.5	2830

Copper	milligrams per litre	1	1	0.004	0.004	0.004
Ethyl benzene	micrograms per litre	1	1	<0.001	<0.001	<0.001
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	56	61.25	67
Manganese	micrograms per litre	1	1	5	5	5
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.01	0.01
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.7	6.8	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	405	422.25	443

Standing Water Level	metres	4	4	1·64	1·7175	1·86
Sulfate	milligrams per litre	4	4	153	168	178
Toluene	milligrams per litre	1	1	<0·002	<0·002	<0·002
Total dissolved solids	milligrams per litre	4	4	1490	1597·5	1730
Total organic carbon	milligrams per litre	4	4	1	1·25	2
Total petroleum hydrocarbons	milligrams per litre	1	1	<0·05	<0·05	<0·05
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
Xylene	milligrams per litre	1	1	<0·002	<0·002	<0·002
Zinc	milligrams per kilogram	1	1	0·013	0·013	0·013

Monitoring Point 8

Groundwater quality monitoring, Monitoring point labelled GABH06S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297977 N6184322

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	393	426·25	458
Aluminium	milligrams per litre	1	1	0·38	0·38	0·38
Arsenic	milligrams per litre	1	1	0·001	0·001	0·001
Barium	milligrams per litre	1	1	0·09	0·09	0·09

Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	0.0002	0.0002	0.0002
Calcium	milligrams per litre	4	4	75	84.25	93
Chloride	milligrams per litre	4	4	470	553.5	590
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.002	0.002	0.002
Conductivity	microsiemens per centimetre	4	4	2880	2990	3080
Copper	milligrams per litre	1	1	0.01	0.01	0.01
Ethyl benzene	micrograms per litre	1	1	< 0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.9	0.9	0.9
Lead	milligrams per litre	1	1	0.003	0.003	0.003
Magnesium	milligrams per litre	4	4	75	75.5	81
Manganese	micrograms per litre	1	1	178	178	178
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.01	0.01
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.9	7.05	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	444	470.75	506
Standing Water Level	metres	4	4	2.15	2.2475	2.4
Sulfate	milligrams per litre	4	4	197	213.25	231
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	1680	1720	1810
Total organic carbon	milligrams per litre	4	4	1	1.25	2
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Zinc	milligrams per kilogram	1	1	<0.031	<0.031	<0.031

Monitoring Point 9

Groundwater quality monitoring, Monitoring point labelled GMW102 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297952.6 N6184807

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	100	197.50	302
Aluminium	milligrams per litre	1	1	3.77	3.77	3.77
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.028	0.028	0.028
Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	21	55.75	73
Chloride	milligrams per litre	4	4	15	17.25	20
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	268	524.75	699

Copper	milligrams per litre	1	1	0.01	0.01	0.01
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.2	0.2	0.2
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	7	18	24
Manganese	micrograms per litre	1	1	28	28	28
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.26	0.26	0.26
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.01	0.01
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.6	6.98	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	21	30.75	36

Standing Water Level	metres	4	4	2	9.20	12.2
Sulfate	milligrams per litre	4	4	11	16.50	20
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	222	453.25	690
Total organic carbon	milligrams per litre	4	4	1	2	3
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Zinc	milligrams per kilogram	1	1	0.017	0.017	0.017

Monitoring Point 10

Groundwater quality monitoring, Monitoring point labelled GMW103 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470.2 N6184603

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	376	424	445
Aluminium	milligrams per litre	1	1	4.61	4.61	4.61
Arsenic	milligrams per litre	1	1	0.001	0.001	0.001
Barium	milligrams per litre	1	1	0.042	0.042	0.042

Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	0.0001	0.0001	0.0001
Calcium	milligrams per litre	4	4	184	206.75	249
Chloride	milligrams per litre	4	4	378	415.5	446
Chromium (hexavalent)	milligrams per litre	1	1	<0.05	<0.05	<0.05
Chromium (total)	milligrams per litre	1	1	0.006	0.006	0.006
Cobalt	milligrams per litre	1	1	0.0001	0.0001	0.0001
Conductivity	microsiemens per centimetre	4	4	2140	2320	2390
Copper	milligrams per litre	1	1	0.08	0.08	0.08
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	0.009	0.009	0.009
Magnesium	milligrams per litre	4	4	64	72.25	85
Manganese	micrograms per litre	1	1	336	336	336
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.13	0.13	0.13

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0325	0.05
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6-9	6.975	7
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	173	188.75	198
Standing Water Level	metres	4	4	7.4	7.565	7.69
Sulfate	milligrams per litre	4	4	120	128	144
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	1480	1580	1680
Total organic carbon	milligrams per litre	4	4	1	1.25	2
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Zinc	milligrams per kilogram	1	1	0.081	0.081	0.081

Monitoring Point 11

Groundwater quality monitoring, Monitoring point labelled GMW104 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297597.9 N6184508

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	230	326.25	499
Aluminium	milligrams per litre	1	1	5.22	5.22	5.22
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.025	0.025	0.025
Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	33	41.75	56
Chloride	milligrams per litre	4	4	31	57.50	101
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.004	0.004	0.004
Cobalt	milligrams per litre	1	1	0.004	0.004	0.004
Conductivity	microsiemens per centimetre	4	4	907	910.75	1340

Copper	milligrams per litre	1	1	0.018	0.018	0.018
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.7	0.7	0.7
Lead	milligrams per litre	1	1	0.005	0.005	0.005
Magnesium	milligrams per litre	4	4	21	27.5	38
Manganese	micrograms per litre	1	1	413	413	413
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.02	0.02	0.02
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.015	0.03
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	7.2	7.3	7.4
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	78	121.25	199

Standing Water Level	metres	4	4	7.28	7.562	7.93
Sulfate	milligrams per litre	4	4	34		65
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	297	514.5	748
Total organic carbon	milligrams per litre	4	4	1	1.25	2
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Zinc	milligrams per kilogram	1	1	0.025	0.025	0.025

Monitoring Point 12

Groundwater quality monitoring, Monitoring point labelled GMW105 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298433.3 N6184397

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	37	43.75	50
Aluminium	milligrams per litre	1	1	36.7	36.7	36.7
Arsenic	milligrams per litre	1	1	0.002	0.002	0.002
Barium	milligrams per litre	1	1	0.127	0.127	0.127

Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	5	6.5	8
Chloride	milligrams per litre	4	4	17	24.5	35
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.023	0.023	0.023
Cobalt	milligrams per litre	1	1	0.014	0.014	0.014
Conductivity	microsiemens per centimetre	4	4	220	245.25	269
Copper	milligrams per litre	1	1	0.059	0.059	0.059
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.3	0.3	0.3
Lead	milligrams per litre	1	1	0.02	0.02	0.02
Magnesium	milligrams per litre	4	4	2	3.25	4
Manganese	micrograms per litre	1	1	676	676	676
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.84	0.84	0.84

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.1	0.1	0.1
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	5.8	5.95	6.1
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	30	35.5	40
Standing Water Level	metres	4	4	10.5	10.96	11.5
Sulfate	milligrams per litre	4	4	12	14.25	16
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	191	219	341
Total organic carbon	milligrams per litre	4	4	1	1.5	2
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Zinc	milligrams per kilogram	1	1	0.077	0.077	0.077

Monitoring Point 13

Groundwater quality monitoring, Monitoring point labelled GMW106 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298356.8 N6184294

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4				
Aluminium	milligrams per litre	1				
Arsenic	milligrams per litre	1				
Barium	milligrams per litre	1				
Benzene	milligrams per litre	1				
Cadmium	milligrams per litre	1				
Calcium	milligrams per litre	4				
Chloride	milligrams per litre	4				
Chromium (hexavalent)	milligrams per litre	1				
Chromium (total)	milligrams per litre	1				
Cobalt	milligrams per litre	1				
Conductivity	microsiemens per centimetre	4				

Copper	milligrams per litre	1				
Ethyl benzene	micrograms per litre	1				
Fluoride	milligrams per litre	1				
Lead	milligrams per litre	1				
Magnesium	milligrams per litre	4				
Manganese	micrograms per litre	1				
Mercury	milligrams per litre	1				
Nitrate	milligrams per litre	1				
Nitrite	milligrams per litre	1				
Nitrogen (ammonia)	milligrams per litre	4				
Organochlorine pesticides	milligrams per litre	1				
Organophosphate pesticides	milligrams per litre	1				
pH	pH	4				
Polycyclic aromatic hydrocarbons	milligrams per litre	1				
Potassium	milligrams per litre	4				
Sodium	milligrams per litre	4				

Standing Water Level	metres	4				
Sulfate	milligrams per litre	4				
Toluene	milligrams per litre	1				
Total dissolved solids	milligrams per litre	4				
Total organic carbon	milligrams per litre	1		DR	1	
Total petroleum hydrocarbons	milligrams per litre	1				
Total Phenolics	milligrams per litre	1				
Xylene	milligrams per litre	1				
Zinc	milligrams per kilogram	1				

Monitoring Point 14

Groundwater quality monitoring, Monitoring point labelled GMW108S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297870.2 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	347	466	583
Aluminium	milligrams per litre	1	1	8.2	8.2	8.2
Arsenic	milligrams per litre	1	1	0.002	0.002	0.002
Barium	milligrams per litre	1	1	0.113	0.113	0.113

Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	26	71.75	137
Chloride	milligrams per litre	4	4	47	268	676
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.007	0.007	0.007
Cobalt	milligrams per litre	1	1	0.007	0.007	0.007
Conductivity	microsiemens per centimetre	4	4	787	1780.25	3720
Copper	milligrams per litre	1	1	0.025	0.025	0.025
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.3	0.3	0.3
Lead	milligrams per litre	1	1	0.007	0.007	0.007
Magnesium	milligrams per litre	4	4	13	51.25	108
Manganese	micrograms per litre	1	1	624	624	624
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.02	0.02	0.02

Nitrite	milligrams per litre	1	1	0.02	0.02	0.02
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0275	0.05
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	7	6.925	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	2	4
Sodium	milligrams per litre	4	4	124	288.25	484
Standing Water Level	metres	4	4	2.44	2.6	2.82
Sulfate	milligrams per litre	4	4	19	92.25	211
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	512	1,103.75	2060
Total organic carbon	milligrams per litre	4	4	2	6.25	10
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Zinc	milligrams per kilogram	1	1	0.034	0.034	0.034

Monitoring Point 15

Groundwater quality monitoring, Monitoring point labelled GMW108D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297871.4 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	457	480.25	513
Aluminium	milligrams per litre	1	1	0.25	0.25	0.25
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.015	0.015	0.015
Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	113	122.75	136
Chloride	milligrams per litre	4	4	528	596.75	637
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	3060	3135	3200

Copper	milligrams per litre	1	1	0.018	0.018	0.018
Ethyl benzene	micrograms per litre	1	1	<2000	<2000	<2000
Fluoride	milligrams per litre	1	1	0.7	0.7	0.7
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	83	88.25	97
Manganese	micrograms per litre	1	1	11	11	11
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.06	0.06	0.06
Nitrite	milligrams per litre	1	1	0.06	0.06	0.06
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0125	0.02
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.8	6.975	7.1
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	403	433.75	471

Standing Water Level	metres	4	4	1.95	2.09	2.28
Sulfate	milligrams per litre	4	4	179	195.5	214
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	1810	1855	1950
Total organic carbon	milligrams per litre	4	4	1	2	3
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.02	<0.02	<0.02
Zinc	milligrams per kilogram	1	1	0.015	0.015	0.015

Monitoring Point 16

Groundwater quality monitoring, Monitoring point labelled GMW109S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297605.7 N6184068

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	226	246.5	272
Aluminium	milligrams per litre	1	1	10.3	10.3	10.3
Arsenic	milligrams per litre	1	1	0.006	0.006	0.006
Barium	milligrams per litre	1	1	0.311	0.311	0.311

Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	0.0006	0.0006	0.0006
Calcium	milligrams per litre	4	4	60	64.75	72
Chloride	milligrams per litre	4	4	168	212.5	265
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.012	0.012	0.012
Cobalt	milligrams per litre	1	1	0.048	0.048	0.048
Conductivity	microsiemens per centimetre	4	4	1080	1472.5	2280
Copper	milligrams per litre	1	1	0.045	0.045	0.045
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.1	0.1	0.1
Lead	milligrams per litre	1	1	0.021	0.021	0.021
Magnesium	milligrams per litre	4	4	35	37.75	39
Manganese	micrograms per litre	1	1	3220	3220	3220
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.04	0.04	0.04

Nitrite	milligrams per litre	1	1	0.04	0.04	0.04
Nitrogen (ammonia)	milligrams per litre	4	4	0.66	0.6875	0.77
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.2	6.275	6.4
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.01	<0.01	<0.01
Potassium	milligrams per litre	4	4	2	2	2
Sodium	milligrams per litre	4	4	151	159	174
Standing Water Level	metres	4	4	2.97	3.2175	3.5
Sulfate	milligrams per litre	4	4	56	79.5	95
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	657	728.25	812
Total organic carbon	milligrams per litre	4	4	2	4.25	7
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Zinc	milligrams per kilogram	1	1	0.178	0.178	0.178

Monitoring Point 17

Groundwater quality monitoring, Monitoring point labelled GMW110 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297572.6 N6184266

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	564	605.75	643
Aluminium	milligrams per litre	1	1	13.7	13.7	13.7
Arsenic	milligrams per litre	1	1	0.002	0.002	0.002
Barium	milligrams per litre	1	1	0.041	0.041	0.041
Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	180	190.75	202
Chloride	milligrams per litre	4	4	630	762.25	818
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.013	0.013	0.013
Cobalt	milligrams per litre	1	1	0.013	0.013	0.013
Conductivity	microsiemens per centimetre	4	4	3960	4075	4160

Copper	milligrams per litre	1	1	0.024	0.024	0.024
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	0.011	0.011	0.011
Magnesium	milligrams per litre	4	4	144	147.25	151
Manganese	micrograms per litre	1	1	524	524	524
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.16	0.16	0.16
Nitrite	milligrams per litre	1	1	0.16	0.16	0.16
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.01	0.01
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.7	6.775	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1.5	2
Sodium	milligrams per litre	4	4	451	460.25	476

Standing Water Level	metres	4	4	3.98	4.08	4.28
Sulfate	milligrams per litre	4	4	292	304.75	318
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	2450	2570	2650
Total organic carbon	milligrams per litre	4	4	1	2.25	4
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Zinc	milligrams per kilogram	1	1	0.047	0.047	0.047

Monitoring Point 18

Groundwater quality monitoring, Monitoring point labelled GMW111 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297588.6 N6184385

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	435	485.75	517
Aluminium	milligrams per litre	1	1	20.8	20.8	20.8
Arsenic	milligrams per litre	1	1	0.006	0.006	0.006
Barium	milligrams per litre	1	1	0.103	0.103	0.103

Benzene	milligrams per litre	1	1	< 0.001	< 0.001	< 0.001
Cadmium	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Calcium	milligrams per litre	4	4	92	108.5	122
Chloride	milligrams per litre	4	4	422	525.75	627
Chromium (hexavalent)	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01
Chromium (total)	milligrams per litre	1	1	0.01	0.01	0.01
Cobalt	milligrams per litre	1	1	0.017	0.017	0.017
Conductivity	microsiemens per centimetre	4	4	2550	2792.5	3300
Copper	milligrams per litre	1	1	0.045	0.045	0.045
Ethyl benzene	micrograms per litre	1	1	< 0.002	< 0.002	< 0.002
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	0.023	0.023	0.023
Magnesium	milligrams per litre	4	4	76	85.75	80
Manganese	micrograms per litre	1	1	755	755	755
Mercury	milligrams per litre	1	1	< 0.0001	< 0.0001	< 0.0001
Nitrate	milligrams per litre	1	1	< 0.01	< 0.01	< 0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0125	0.02
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.8	6.975	7.1
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	349	387.25	455
Standing Water Level	metres	4	4	6.2	6.275	6.39
Sulfate	milligrams per litre	4	4	122	153.75	205
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	1540	1697.5	1930
Total organic carbon	milligrams per litre	4	4	1	1.25	2
Total petroleum hydrocarbons	milligrams per litre	1	1	0.09	0.09	0.09
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Standing Water Level	metres	4	4	2-74	2.9025	3-11
Sulfate	milligrams per litre	4	4	23	25.75	28
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	991	1057.75	1140
Total organic carbon	milligrams per litre	4	4	1	1	1
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.5	<0.5	<0.5
Xylene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Zinc	milligrams per kilogram	1	1	0.006	0.006	0.006

Monitoring Point 20

Groundwater quality monitoring, Monitoring point labelled BH6 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297807.4 N6184052

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	697	729.75	777
Aluminium	milligrams per litre	1	1	0.58	0.58	0.58
Arsenic	milligrams per litre	1	1	0.002	0.002	0.002
Barium	milligrams per litre	1	1	0.056	0.056	0.056

Benzene	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	118	123.5	137
Chloride	milligrams per litre	4	4	850	935.5	971
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	0.012	0.012	0.012
Conductivity	microsiemens per centimetre	4	4	4160	4765	5040
Copper	milligrams per litre	1	1	0.014	0.014	0.014
Ethyl benzene	micrograms per litre	1	1	<0.002	<0.002	<0.002
Fluoride	milligrams per litre	1	1	0.8	0.8	0.8
Lead	milligrams per litre	1	1	0.004	0.004	0.004
Magnesium	milligrams per litre	4	4	121	128.75	140
Manganese	micrograms per litre	1	1	1700	1700	1700
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.07	0.07	0.07

Nitrite	milligrams per litre	1	1	0.07	0.07	0.07
Nitrogen (ammonia)	milligrams per litre	4	4	0.06	0.0775	0.12
Organochlorine pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
Organophosphate pesticides	milligrams per litre	1	1	<0.0005	<0.0005	<0.0005
pH	pH	4	4	6.6	6.825	7
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<0.001	<0.001	<0.001
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	728	811	877
Standing Water Level	metres	4	4	1.24	1.415	1.54
Sulfate	milligrams per litre	4	4	251	287.5	313
Toluene	milligrams per litre	1	1	<0.002	<0.002	<0.002
Total dissolved solids	milligrams per litre	4	4	2880	2902.5	2940
Total organic carbon	milligrams per litre	4	4	1	4.5	9
Total petroleum hydrocarbons	milligrams per litre	1	1	<0.05	<0.05	<0.05
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<0.002	<0.002	<0.002

Zinc	milligrams per kilogram	1	1	0.024	0.024	0.024

Monitoring Point 21

Subsurface gas monitoring, Monitoring point labelled LFG MW1 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298084 N6184278

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.0002	0.0004

Monitoring Point 22

Subsurface gas monitoring, Monitoring point labelled LFG MW2 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298202 N6184228

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	<0.0001	0.0003	0.0006

Monitoring Point 23

Subsurface gas monitoring, Monitoring point labelled LFG MW3 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298297 N6184244

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	<0.0001	0.0004	0.0009

Monitoring Point 24

Subsurface gas monitoring, Monitoring point labelled LFG MW4 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	<0.0001	0.0005	0.002

Monitoring Point 25

Subsurface gas monitoring, Monitoring point labelled LFG MW5 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298438 N6184381

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	<0.0001	0.0008	0.0033

Monitoring Point 26

Subsurface gas monitoring, Monitoring point labelled LFG MW6 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	<0.0001	0.0008	0.0016

Monitoring Point 27

Subsurface gas monitoring, Monitoring point labelled LFG MW7 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470 N6184553

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.0018	0.0037

Monitoring Point 28

Subsurface gas monitoring, Monitoring point labelled LFG MW8 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.0012	0.0028

Monitoring Point 29

Subsurface gas monitoring, Monitoring point labelled LFG MW9 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298465 N6184645

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.0044	0.0228

Monitoring Point 30

Subsurface gas monitoring, Monitoring point labelled LFG MW10 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298448 N6184684

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.0008	0.0037

Monitoring Point 31

Subsurface gas monitoring, Monitoring point labelled LFG MW11 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298400 N6184695

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	12	12	0.0001	0.0006	0.0014

Monitoring Point 32

Subsurface gas monitoring, Monitoring point labelled LFG MW12 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298351 N6184701

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0.0001	0.0967	1.1488

Monitoring Point 33

Stormwater monitoring point, Downstream monitoring point labelled 4 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297767 N6183396

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	3	3	41	109-67	207
Ammonia	milligrams per litre	3	3	0.01	0.10	0.26
Calcium	milligrams per litre	3	3	11	26.67	46
Chloride	milligrams per litre	3	3	16	36	57
Conductivity	microsiemens per centimetre	3	3	224	408.33	652
Dissolved Oxygen	milligrams per litre	3	3	1.45	6-33	9-69
Filterable iron	milligrams per litre	3	3	0-13	0.38	0.52

Fluoride	milligrams per litre	3	3	0·1	0·17	0·2
Magnesium	milligrams per litre	3	3	6	13	22
Nitrate	milligrams per litre	3	3	0·01	0·56	1·33
pH	pH	3	3	7·3	7·5	7·8
Potassium	milligrams per litre	3	3	4	4·33	5
Sodium	milligrams per litre	3	3	19	35·67	53
Sulfate	milligrams per litre	3	3	1	13·33	28
Temperature	degrees Celsius	3	3	13·3	20·07	26·6
Total organic carbon	milligrams per litre	3	3	5	7·33	9
Total Phenolics	milligrams per litre	3	3	<0·05	<0·05	<0·05
Total suspended solids	milligrams per litre	3	3	36	41·67	47

Monitoring Point 34

Stormwater monitoring point, Upstream monitoring point labelled 6 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297495 N6184504

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	3	3	34	107·33	183
Ammonia	milligrams per litre	3	3	0·03	0·04	0·05

Calcium	milligrams per litre	3	3	11	31·33	51
Chloride	milligrams per litre	3	3	14	34·33	52
Conductivity	microsiemens per centimetre	3	3	171	394·33	618
Dissolved Oxygen	milligrams per litre	3	3	3·7	7·9	11
Filterable iron	milligrams per litre	3	3	0·05	0·25	0·57
Fluoride	milligrams per litre	3	3	0·1	0·17	0·2
Magnesium	milligrams per litre	3	3	5	14·33	23
Nitrate	milligrams per litre	3	3	0·04	0·55	1·15
pH	pH	3	3	7·6	7·73	7·9
Potassium	milligrams per litre	3	3	3	3·33	4
Sodium	milligrams per litre	3	3	15	30·33	43
Sulfate	milligrams per litre	3	3	12	24·33	31
Temperature	degrees Celsius	3	3	12·6	18·93	25
Total organic carbon	milligrams per litre	3	3	3	5·33	7
Total Phenolics	milligrams per litre	3	3	<0·05	<0·05	<0·05
Total suspended solids	milligrams per litre	3	3	6	20·67	46

C Statement of Compliance - Licence Conditions

C1 Compliance with Licence Conditions

(☑ the boxes)

1 Were all conditions of the licence complied with (including monitoring and reporting requirements)? ☐ Yes ☑ No

(✓ a box)

2 If you answered 'No' to question 1, please supply the following details for each non -compliance in the format, or similar format , provided on the following page.

Please use a separate page for each licence condition that has not been complied with.

a) What was the specific licence condition that was not complied with?

b) What were the particulars of the non -compliance?

c) What were the date(s) when the non -compliance occurred, if applicable?

d) If relevant, what was the precise location where the non -compliance occurred?

Attach a map or diagram to the Statement to show the precise location.

e) What were the registrati on numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?

f) What was the cause of the non -compliance?

g) What action has been, or will be, taken to mitigate any adverse effects of the non -compliance?

h) What action has been, or will be, taken to prevent a recurrence of the non -compliance?

3. How many pages have you attached?

Each attached page must be initialled by the person(s) who signs Section G of this Annual Return

1*

* PLUS ONE DISCLOSURE REGARDING AN OFFICIAL CAUTION RECEIVED ON 21 MAR 16

B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables provided below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

C2 Details of Non Compliance with Licence 5862

a) What was the specific Licence condition that has not been complied with?

Licence condition L2.1 was not complied with, which states:
"For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table".
The results at Discharge Point 1 indicated a Suspended Solids (SS) reading greater than the licence concentration of 50mg/l.

b) What were the particulars of the non-compliance?

During a heavy rainfall event, a sample of water exiting Whytes Gully detention ponds indicated total suspended solids were 116 mg/L which is 66 mg/L more than the concentration limit provided in the sites Environment Protection Licence.

c) What were the date(s) when the non-compliance occurred?

25 August 2015.

d) If relevant, what was the precise location where the non-compliance occurred?

Stormwater monitoring and discharge point 1 (E297,777, N6,183,972)

e) What were the registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?

Not applicable

f) What was the cause of the non-compliance?

The discharge of turbid water was caused by a heavy rainfall event in which the site was inundated with water. The major construction works relating to the new landfill cell development and associated infrastructure is understood to be a major contributor to the source of sediment in the control ponds. Additionally, the pond holding capacity was not at its optimal volume when the rainfall event took place.
The large volume of rainfall and overall turbid water witnessed throughout the catchment at this time indicated that the non-compliance did not have the potential to cause material harm to the environment as defined by Section 147 of the POEO Act (1997).

g) What action has been, or will be taken to prevent a recurrence of the non-compliance?

A Wet Weather and Stormwater Management work instruction has been created and implemented to ensure that the sediment pond capacity is maintained between rainfall events.
The Wet Weather and Stormwater Management work instruction is attached to this report.

h) What action has been, or will be, taken to mitigate any adverse effects of the non-compliance?

The water that exited the site contained suspended solids at levels above the 50 mg/L concentration limit prescribed in the sites Environment Protection Licence. Given that the entire catchment was visibly turbid and heavily laden with sediment at the time (both upstream and downstream samples taken at the same time indicated suspended solids approaching the 50 mg/L concentration limit) there was no material harm caused by the non-compliance. The Wet Weather and Stormwater Management work instruction detailed in part g) above will help to ensure future non-compliances do not take place. Additionally, siltation and erosion arresting devices have been installed, please see images below.

Image 1 Extra sediment fence

Image 2 Extra sediment fence installation

Image 3 Hay bales placed around outlet

Image 4 Outlet trash basket wrapped in geofabric

C2 Details of Disclosure for Licence 5862

a) What was the specific Licence condition that has not been complied with?

Licence condition R1.7 was not accurately reported. R1.7 states:
"Within the Annual Return, the Statement of Compliance must be certified".
Whilst the Statement of Compliance was certified, it did not accurately reflect the two penalty notices received in May 2014. Therefore this report is made for full disclosure.

b) What were the particulars of the non-compliance?

Council received an Official Caution dated 21 March 2016 for failing to identify the 2013-14 issued penalty notices within the Statement of Compliance section of the 2013-14 Annual Return.
Whilst comment and analysis was provided inside the full report (of which the Statement of Compliance is part) the non-compliances were not tallied inside the Statement of Compliance.

c) What were the date(s) when the non-compliance occurred?

The incidents took place on 22 May 2014 and the Annual Report (period 29 May 2013 to 28 May 2014) was completed over many weeks with the majority of the report completed prior to this event.

d) If relevant, what was the precise location where the non-compliance occurred?

Not applicable, this was an administrative non-compliance

e) What were the registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?

Not applicable

f) What was the cause of the non-compliance?

The penalty notices were issued at the very end of the reporting period, whilst investigations into the cause of the penalty notices were still being completed and whilst the Annual Return was concurrently being finalised. Whilst the incidents were described in the body of the report, the Annexure which contained the Statement of Compliance was filled in by a different member of staff, who assumed that the Penalty Notices were received outside of the reporting period and therefore accidently omitted them from the Statement of Compliance details.

g) What action has been, or will be taken to prevent a recurrence of the non-compliance?

Relevant Council staff have been trained in the Wollongong Waste and Resource Recovery Park's Environment Protection Licence and reporting requirements. This training is aimed at building team knowledge and understanding the specific reporting sections within an Annual Environment Management Report, including the difference between the "Annual Return" section and the "Annual Report" as a whole. Further to this, Council is currently developing site Work Instructions that will help detail all Site reporting requirements.

h) What action has been, or will be, taken to mitigate any adverse effects of the non-compliance?

The 2015-16 Annual Environment Management Report refers to the error in the previous report Annexure, which for all intents and purposes supersedes the previous report.
Council acknowledges the importance of accurate reporting in the Annual Returns and endeavours to provide true and complete records when submitting these documents.
This error was in no way an attempt to conceal the non-compliance (note that the non-compliance was referred to inside the written portion of the Annual Report), nor there be any benefit in doing so as the penalties were made public through the local media and are also available to the public on the Environment Protection Authority's website

E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Is the PIRMP available at the premises?

(✓ a box) ☑ Yes ☐ No

3 Is the PIRMP available in a prominent position on a publicly accessible web site?

(✓ a box) ☑ Yes ☐ No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address: www.wollongong.nsw.gov.au/services/household/pages/wastesitesanalyticalmonitoringdata.aspx

4 Has the PIRMP been tested?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on 18/5/2016

5 Has the PIRMP been updated?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on 31/3/2016

6 How many times has the PIRMP been activated in this reporting period? NIL

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated:

The PIRMP was activated on __/__/____

The EPA's guidelines for preparation of pollution incident response management plans are available at

http://www.epa.nsw.gov.au/legislation/20120227epgreppirmp.htm

F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(✓ a box) ☑ Yes ☐ No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(✓ a box) ☑ Yes ☐ No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address WWW.Wollongong.nsw.gov.au/services/Household/pages/wastesitedatapublicmonitoringdata.aspx

The EPA's written requirements for publishing pollution monitoring data are available at http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm

Note - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data.

G Statement of Compliance - Environmental Management Systems and Practices

1 Do you have an environmental management system (EMS) certified to IS0 14001 or any other demonstrated equivalent system[1]? (see note below on demonstrated equivalent)

(✓ a box) ☐ Yes ☑ No

If your answer to question 1 is 'No', please proceed to question 5. If your answer to question 1 is 'Yes', please proceed to question 2.

2 When was the last check of the EMS[2] completed (see note below on check of EMS)? __ / __ / ____

3 Were there any non-conformances related to environmental issues identified in the last check of the EMS?

(✓ a box) ☐ Yes ☐ No

4 If there were non-conformances identified, were these non-conformances rectified?

(✓ a box) ☐ Yes ☐ No

If you answered 'No' to question 1, please answer questions 5 - 11. If you answered 'Yes' to question 1 please proceed to section H. Questions 5-11 relate to any documented environmental practices, procedures and systems in place. Refer to http://www.epa.nsw.gov.au/licensing/EMCP.htm for guidance on how to complete questions 5 to 11. If unsure of the answer, tick No.

5 Have you conducted an assessment of your activities and operations to identify the aspects that have a potential to cause environmental impacts and implemented operational controls to address these aspects?

(✓ a box) ☑ Yes ☐ No

6 Have you established and implemented an operational maintenance program, including preventative maintenance?

(✓ a box) ☑ Yes ☐ No

7 Do you keep records of regular inspections and maintenance of plant and equipment?

(✓ a box) ☑ Yes ☐ No

8 Do you conduct regular site audits to assess compliance with environmental legal requirements and assess conformance to the requirements of any documented environmental practices, procedures and systems in place?

(✓ a box) ☑ Yes ☐ No

8a If yes, how often? QUARTERLY

9 Are the audits of documented environmental practices, procedures and systems undertaken by a third party?

(✓ a box) ☐ Yes ☑ No

10 Have you established and implemented an environmental improvement or management plan?

(✓ a box) ☑ Yes ☐ No

11 Do you train staff in environmental issues that may arise from your activities and operations and keep records of this

(✓ a box) ☑ Yes ☐ No

[1] Demonstrated equivalent refers to an environmental management system that the EPA considers is equivalent to the accountability, procedures, documentation and record keeping requirements of an ISO 14001 system. For further information go to:
http://www.epa.nsw.gov.au/resources/licensing/150402-environmental-management-systems-guidelines.pdf

[2] Undertaking a 'check of an EMS' refers to the ISO 14001 requirements that an organisation demonstrates conformity to the requirements of its EMS and to the standard, these checks require third-party certification that requirements have been met.

H Statement of Compliance - Environmental Improvement Works

Before reporting on environmental improvement works please consider the following:

Environmental improvement works must meet the following criteria:

- They are not required to comply with licence conditions or legislative requirements.
- They have been undertaken voluntarily, and are in addition to any works required to comply with any licence conditions or legislative requirements under the Protection of the Environment Operations Act 1997 or its regulations.
- They relate to the licensed activity at the licensed premises.
- They aim to reduce air, water, noise pollution or incident potential at the premises.
- They were completed in the reporting period covered by this annual return. They are not ongoing.

If the works reported in this annual return do not meet the criteria set out above they will not be included in the calculation of the environmental management category for this licence.

1 Have you voluntarily completed any environmental improvement works in this licence reporting period that have resulted in demonstrated environmental improvements at the premises?

(✓ a box) ☐ Yes ☒ No

If you answered 'Yes', please provide the following supporting information:

Brief description of works.
Demonstration of environmental improvement resulting from the works at the premises. Include details of: - Controls in place before works undertaken - New controls put in place - Description of environmental improvements (e.g. reducing air, water, noise pollution or incident potential) due to the works. - Where possible, quantitative data (e.g. monitoring) to demonstrate the improved environmental outcome.
Date when works were completed (Note: ongoing works are not applicable) ___/___/_____ Estimated cost of works:

I Signature and Certification

This Annual Return may only be signed by a person(s) with legal authority to sign it as set out in the categories below. **Please tick (✓) the box** next to the category that describes how this Annual Return is being signed.

If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700.

If the licence holder is:		the Annual Return must be signed and certified:
an individual	☐	by the individual licence holder, or
	☐	by a person approved in writing by the EPA to sign on the licence holder's behalf
a company	☐	by affixing the common seal in accordance with Corporations Act 2001, or
	☐	by 2 directors, or
	☐	by a director and a company secretary, or
	☐	if a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	☐	by a person delegated to sign on the company's behalf in accordance with the Corporations Act 2001 **and** approved in writing by the EPA to sign on the company's behalf.
a public authority (other than a council)	☐	by the Chief Executive Officer of the public authority, or
	☐	by a person delegated to sign on the public authority's behalf in accordance with its legislation **and** approved in writing by the EPA to sign on the public authority's behalf.
a local council	☑	by the General Manager in accordance with s.377 of the Local Government Act 1993, or
	☐	by affixing the seal of the council in a manner authorised under that Act.

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of $250,000 for a corporation or $120,000 for an individual.

I/We

- *declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and*
- *certify that the information in the Statement of Compliance in sections A, C, D, E, F, G and H and any pages attached to Section C is correct and not false or misleading in a material respect.*

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates below and specify the new dates to which this Annual Return relates below:

For the reporting period 29-May-2015 to 28-May-2016 or ___/___/___ to ___/___/___

SIGNATURE: _____ SIGNATURE: _____

NAME: (printed) DAVID FARMER NAME: (printed) _____

POSITION: GENERAL MANAGER POSITION: _____

DATE: 21 / 07 / 2016 DATE: ___/___/___

SEAL(if signing under seal)

PLEASE ENSURE THAT ALL APPROPRIATE BOXES HAVE BEEN COMPLETED AND THAT THE CHECKLIST ON PAGE 2 OF THE ANNUAL RETURN HAS BEEN COMPLETED

EPA SUBMISSION

Wollongong City Council

Whytes Gully Waste Disposal Facility
Annual Report

Period 01 June 2013 – 31 May 2014

Reference Z14/248285

wollongong
city of innovation

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ABBREVIATIONS

Al	Aluminium
ANZECC	Australian and New Zealand Environment Conservation Council
Ar	Arsenic
Ba	Barium
Ca	Calcium
$CaCO_3$	Calcium Carbonate
Cd	Cadmium
CH_4	Methane
Cl	Chloride
Co	Cobalt
Cr	Chromium
Cu	Copper
DC	Development Consent
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
F	Fluoride
K	Potassium
LEMP	Landfill Environmental Management Plan
Mg	Magnesium
Mn	Manganese
Na	Sodium
NH_3	Ammonia
NO_3	Nitrate
NO_2	Nitrite

ppm	Parts per Million
SO_4	Sulfate
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
WWARRP	Wollongong Waste and Resource Recovery Park
Zn	Zinc

1 INTRODUCTION

1.1 BACKGROUND

The City of Wollongong is located 80 kilometres south of Sydney and is Australia's 9th largest city. The Wollongong City Council (Council) governance area occupies a relatively narrow coastal strip bordered by the Royal National Park to the north, the Windang Bridge and Yallah to the south, the Tasman Sea to the east and the escarpment to the west.

Council owns and operates the Wollongong Waste and Resource Recovery Park (the Site), which is located on Reddalls Road at Kembla Grange. The Site is situated south west of Wollongong's central business district on approximately 50 hectares and is comprised of Lots 50, 52 and 53 of DP 1022266 and Lot 2 of DP 240557.

Council holds an Environmental Protection Licence (EPL) number 5862, for "Waste Disposal - Application to Land" for the Site. Council currently operates in accordance with the sites Landfill Environmental Management Plan (LEMP) and in accord with the requirements of the Sites EPL and Development Consent (DC).

1.2 OBJECTIVES OF THE ANNUAL REPORT

Condition R1.8 of the EPL specifies that Council must provide an Annual Report to accompany the Annual Return for the Site. The objective of this report is to provide that review.

1.3 SITE HISTORY

Whytes Gully was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. Initially, the 'western gully' section was landfilled. The western gully is unlined by modern standards and was used from 1982 to 1993. Initially coal wash refuse was used to provide daily cover, then around 1988/89 steel furnace slag was introduced because of its stability in wet weather and Council's inability to source local clean fill in sufficient quantities. The leachate collection from the western gully is through a series of rock drains at the centre of each lift. The rock drains connect with a riser and the leachate flows from riser to riser, and then to the leachate collection well at the base of the western gully. The western gully section of the landfill has been capped with clay to varying depths between 1m and 4m.

The 'eastern gully' section development received consent in 1992/93, following extensive public consultation. The eastern gully section is lined with a single layer of HDPE smooth liner, over a subsoil drainage layer of 5mm

gravel and a corrugated groundwater drainage system. The eastern gully was excavated to rock and was developed in two stages, beginning with the first stage 80 to 100m above the slope from the current toe of the landfill embankment. The leachate is drained from the first stage of the eastern gully via a 300mm corrugated drainage pipe at the base and a 300mm thick sand layer above the liner.

The second stage of the eastern gully operates in front and above the first stage, with extended leachate drains and HDPE liner. The eastern gully has intermediate cover of varying quality on the embankments.

The new third stage of the eastern gully commenced construction in August 2013 and is set to be completed in mid to late 2014. No waste was placed into the third stage of the landfill during the review period, or to date.

Leachate is collected from all landfilled areas at the site and treated in a 3 stage process. The leachate is initially collected in a primary holding pond that uses a biological process and aeration primarily to strip the leachate of ammonia. The leachate is then pumped to a smaller pond with a greater surface area to increase the speed of this process. From the smaller pond the leachate is then pumped to a sequence batch reactor that in conjunction with a filtration system eliminates the residual contaminants in the leachate suitable for acceptance by sewer under the sites Trade Wastewater Agreement with Sydney Water.

1.4 *RELEVANT DOCUMENTS*

This annual report refers to and / or draws upon information and data from the following documents;

- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2012 to 31 May 2013. By Wollongong City Council July 2013
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2011 to 31 May 2012. By Wollongong City Council July 2012
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2010 to 31 May 2011. By Wollongong City Council July 2011.
- Whytes Gully Waste Disposal Facility – Annual Report for Period 01 June 2009 to 31 May 2010. By GHD July 2010.

2 KEY LICENCE ISSUES

2.1 ENVIRONMENTAL PROTECTION LICENCE ANNUAL RETURNS

The Environment Protection Authority (EPA) has issued an *Environmental Protection Licence* (Licence No. 5862) for the landfill and related operations on the Whytes Gully site. The licence, issued under the *Protection of the Environment Operations Act 1997,* requires an annual return and report to be submitted to the EPA, detailing;

a) Statement of compliance; and

b) Monitoring and complaints summary.

c) Tabulated results of all monitoring data required by the licence from at least the last three years (if available).

d) A graphical presentation of the data for at least three years (if available).

e) Notations made regarding any statistically significant variations or anomalies.

f) An analysis and interpretation of all monitoring data.

g) An analysis of and response to any complaints received.

h) Identification of any deficiencies in environmental performance and remedial action taken or proposed to be taken.

i) Recommendations on improving the sites environmental performance.

The EPL Annual Returns for 2008 to 2013 reporting periods were reviewed to provide a background to this report. These Annual Returns can be summarised as follows:

01 June 2008 to 31 May 2009
B1. Pollution complaints - Nine
B2. Concentration monitoring summary – Complete
B3. Volume or mass monitoring summary - None required
C1. Compliance with licence condition – Ten non compliances.
C2. Details of non-compliance

1. *Stormwater pH measurement > 8.5*
2. *Four missed stormwater conductivity measurements*
3. *Stormwater suspended solids > 50mg/L twice*
4. *Four missed potassium groundwater measurements*
5. *One missed groundwater redox, coliforms and dissolved oxygen measurements*
6. *Three missed groundwater alkalinity measurements*

7. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium tests*
8. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*
9. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*
10. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*

01 June 2009 to 31 May 2010
B1. Pollution complaints - Twelve
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Five non compliances.
C2. Details of non-compliance

1. *Two missed stormwater temperature measurements*
2. *Missed stormwater filterable iron measurement*
3. *One round of groundwater monitoring missed*
4. *One round of groundwater monitoring missed*
5. *One round of landfill gas monitoring missed*

01 June 2010 to 31 May 2011
B1. Pollution complaints – Twelve
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non-compliance.
C2. Details of non-compliance – N/A

01 June 2011 to 31 May 2012
B1. Pollution complaints – Forty Eight
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non-compliance.
C2. Details of non-compliance – N/A

01 June 2012 to 31 May 2013
B1. Pollution complaints – Fifty nine
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non-compliance.
C2. Details of non-compliance – N/A

In summary, compliance issues have generally been restricted to minor exceedances of pH and suspended solids in the sediment pond, and these issues are covered by ongoing monitoring provisions.

A potential problem existed prior to June 2010 with seemingly regular missed analytical testing regimes over the previous two years. Subsequently, Council

formally tendered for the environmental testing at the site, which now ensures regular testing routines are in place under contract performance requirements.

The EPL has had several variations applied to it in recent years. These changes include:

- Site boundaries updated to excise the previous Solid Waste to Energy Recovery Facility from the landfill licence to allow Visy to gain their own licence for the retrofit of the building as a Materials Recovery Facility. Also addition of a Potential Offensive Odour clause and analytical unit measures amended on 08 July 2014

- Wording amendments and consolidation of various clauses as well as monitoring point updates in 23 August 2013

- Tidy up of various incremental site changes including lot and boundary amendments, sampling point review and update including location detail, removal of redundant trial and reporting details and various other updates in line with EPA reformatting and internal software and consistency changes 16 April 2012.

- Addition of pollution studies and reduction programs added on 28 November 2008.

- Scheduled Activity and Waste Classification structure changed on 17 October 2008.

- Reformatted licence including specification for cover material, litter control and other operational processes 20 November 2007.

- Clarification of water pollution prevention requirements on 11 October 2005.

- Overhauled and reformatted licence resulting from Council's request to modernise environmental testing requirements and to formally recognise the increased environmental sampling points and standards adopted by Council for the site. The request formed Annexure B of the 2010/2011 Annual Environmental Management Report and was formally approved and adopted by the EPA on 16 April 2012.

- Inclusion of further enhanced and upgraded environment sampling points on 23 August 2013 for the Stage 3 (new landfill cell development).

3 *REVIEW OF LANDFILL MONITORING DATA*

3.1 *GROUNDWATER MONITORING*

Recent site investigations resulting from Council's Environment Application lodged with the State Government on 01 April 2012, have confirmed a predominant approximate south-southwest groundwater flow direction. The groundwater flow direction should be used to contextualise monitoring bore locations and any elevated results, please refer to the sites Environmental Monitoring Locations located in Annexure A of this document.

3.1.1 *Tabulated Results*

Analyte		13 August 2013																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	955	673	322	408	243	382	238	51	DRY	340	459	873	554	435	223	711
Calcium	mg/l	*	302	354	113	89	50	216	45	9		25	131	309	192	91	83	122
Chloride	mg/L	*	1080	1180	659	630	29	486	54	34		200	627	163	797	494	370	992
Conductivity	µS/cm	*	5450	5530	3200	3120	621	2490	513	253		1480	3330	2310	4030	2640	1700	5170
Magnesium	mg/L	*	197	213	73	81	22	77	26	5		20	92	65	151	75	45	129
Nitrogen	mg/L	*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03		<0.01	<0.01	7.76	<0.01	<0.01	<0.01	07
Potassium	mg/L	*	3	2	1	1	2	1	1	2		2	<1	16	2	2	2	<1
Sodium	mg/L	*	645	546	460	494	58	191	106	35		258	459	175	476	383	189	852
Water Level	m	*	4.72	36	1.66	2.18	9.55	7.71	6.88	10.54		2.64	2.14	3.32	4.02	6.25	2.96	1.46
Sulfate	mg/L	*	169	194	194	214	31	131	36	12		55	185	183	279	106	24	283
TDS	mg/L	*	3230	3390	1720	1800	350	1440	362	167		728	1700	1460	2390	1360	933	2920
TOC	mg/L	*	8	5	2	2	5	2	4	4		11	3	50	3	3	1	3
pH	pH	*	6.6	6.7	6.7	7.1	7.3	6.8	6.6	5.3		6.8	6.8	7.1	6.6	7	7.3	6.9

Table 3.1.1(a) Quarterly analyte testing results for August 2013, * Note Bore destroyed

Analyte		06 November 2013																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	974	658	318	399	DRY	265	404	48	DRY	319	446	822	547	437	222	719
Calcium	mg/L	*	299	342	127	97		196	49	4		16	124	189	178	73	44	122
Chloride	mg/L	*	1160	1280	700	658		524	91	41		204	653	165	848	112	382	1120
Conductivity	µS/cm	*	5330	5310	3090	3110		2460	1220	258		1620	3170	2110	3950	2510	1650	5040
Magnesium	mg/L	*	194	208	83	94		72	32	2		16	92	56	151	73	44	136
Nitrogen	mg/L	*	0.03	02	0.02	0.02		0.02	0.02	0.02		0.03	0.02	7.1	0.01	0.01	0.02	0.07
Potassium	mg/L	*	3	2	1	1		1	1	1		1	1	11	2	1	2	1
Sodium	mg/L	*	661	554	453	486		192	164	34		280	474	183	500	397	201	882
Water Level	m	*	5.02	0.72	2.02	2.5		7.57	7.34	10.83		2.84	2.23	3.62	4.23	6.43	3.23	1.64
Sulfate	mg/L	*	160	194	203	215		138	56	13		55	193	93	280	112	25	283
TDS	mg/L	*	3550	3890	1900	1800		1710	674	197		753	1830	1330	2590	1380	1060	2930
TOC	mg/L	*	44	35	18	17		21	20	11		15	23	80	28	19	9	17
pH	pH	*	66	6.6	6.7	7		6.9	7.3	5.7		6.9	6.8	7	6.7	6.9	75	6.8

Table 3.1.1(b) Quarterly analyte testing results for November 2013

Analyte		27 February 2014																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	984	673	324	404	DRY	347	410	46	DRY	345	455	412	564	441	224	718
Calcium	mg/L	*	346	380	125	97		203	60	6		19	141	133	214	104	90	134
Chloride	mg/L	*	1060	1160	631	611		491	90	32		123	613	225	787	473	363	718
Conductivity	µS/cm	*	5060	4920	3050	3080		2390	1240	258		1030	3140	1590	38.7	2410	1600	4720
Magnesium	mg/L	*	209	219	76	87		70	34	3		13	98	42	160	79	47	137
Nitrogen	mg/L	*	0.02	0.04	0.01	0.02		0.02	0.05	0.01		0.04	0.01	3.27	0.03	0.04	0.02	0.08
Potassium	mg/L	*	3	2	1	1		1	1	1		2	1	7	2	1	2	1
Sodium	mg/L	*	601	483	440	480		159	1370	41		198	433	165	442	340	185	783
Water Level	m	*	6	0.6	1.92	2.4		7.78	7.54	1		9	2.21	3.47	4.16	6.37	3.1	1.47
Sulfate	mg/L	*	166	198	201	217		138	56	13		40	196	82	288	113	25	288
TDS	mg/L	*	3100	3430	1600	1750		1580	659	186		650	1730	880	2390	1320	959	2650
TOC	mg/L	*	6	4	1	1		1	2	1		9	2	14	2	1	1	2
pH	pH	*	6.6	6.5	6.8	7		6.8	7.2	6		6.9	6.8	6.4	6.7	7	7.2	6.7

Table 3.1.1(c) Quarterly analyte testing results for February 2014

Analyte		12 May 2014																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	1090	738	364	396	271	436	320	44	DRY	494	509	980	623	483	249	816
Calcium	mg/L	*	310	347	111	78	56	204	44	4		84	128	274	191	90	85	120
Chloride	mg/L	*	1150	1240	660	579	24	486	58	38		424	659	180	841	504	368	816
Conductivity	µS/cm	*	5350	5470	2690	2810	594	2380	915	250		3460	3300	2400	4060	2570	1680	4960
Magnesium	mg/L	*	199	210	70	72	17	73	24	2		64	91	60	155	73	45	130
Nitrogen	mg/L	*	0.02	0.07	0.01	0.06	0.02	0.27	0.17	0.01		0.06	0.15	5.98	0.05	0.03	0.14	0.12
Potassium	mg/L	*	3	2	1	1	1	1	1	1		1	1	13	2	1	2	1
Sodium	mg/L	*	566	464	402	392	47	168	99	42		295	392	161	435	326	174	760
Water Level	m	*	4.79	0.38	1.64	2.24	10.57	7.65	7.14	4		7	2.15	3.32	4.06	6.1	2.86	1.47
Sulfate	mg/L	*	187	224	209	204	22	149	41	14		127	215	190	319	123	28	302
TDS	mg/L	*	2800	2910	1660	1420	411	1320	357	125		1150	1560	1290	2130	1270	769	1500
TOC	mg/L	*	5	4	1	2	4	2	4	4		7	1	38	2	1	1	2
pH	pH	*	66	6.6	7.2	7.2	7.3	6.9	7.2	5.7		6.8	6.9	7	6.9	7.2	7.4	6.8

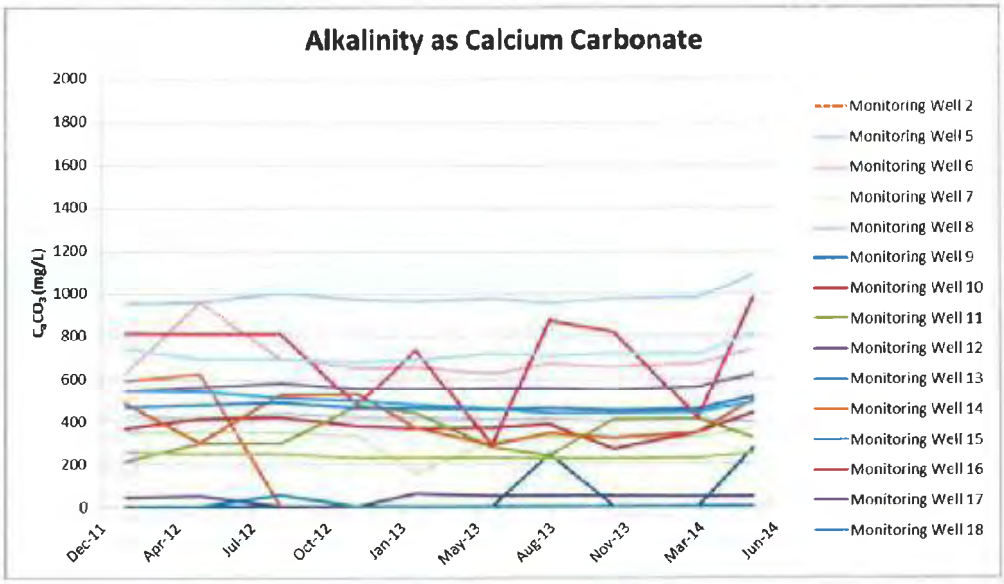
Table 3.1.1(d) Quarterly analyte testing results for May 2014

		13 August 2013																
Analyte	**Units**	**2**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Aluminium	mg/L	*	02	<0 01	0 04	0 08	7 77	0 1	0 1	10 3	DRY	4 63	0 08	0 67	0 55	0 69	0 08	0 05
Arsenic	mg/L	*	<0 001	<0 001	<0 001	< 001	<0 001	<0 001	<0 001	<0 001		0 002	<0 001	0 005	<0 001	0 69	<0 001	0 003
Barium	mg/L	*	002	0 016	0 008	0 117	055	0 023	0 014	0 056		0 117	0 016	0 46	< 006	<0 001	0 126	0 055
Benzene	µg/	*	<1	<1	<1	<1	<1	<1	<1	<1		1	1	1	<1	0 033	<1	<1
Cadmium	mg/L	*	<0 001	< 0001	<0 000 1	<0 000 1	0004	<0 000 1	<0 000 1	<0 000 1		<0 000 1	<0 000 1	0 0002	<0 000 1	<1	0 0001	<0 000 1
Chromium (hex.)	mg/L	*	<0 01	<0 01	<0 01	<0 01	< 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 01	<0 01	0 0002	<0 01	<0 01
Chromium (total)	mg/L	*	<0 001	<0 001	<0 001	<0 001	003	0 012	0 001	0 008		0 004	<0 001	0 002	<0 001	<0 01	<0 001	<0 001
Cobalt	mg/L	*	<0 001	0 002	0 001	0 001	004	<0 004	<0 002	0 004		0 009	<0 001	0 004	<0 001	<0 001	<0 001	<0 01
Copper	mg/L	*	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
Ethyl Benzene	µg/L	*	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2	<2	<2	<2
Fluoride	mg/L	*	0 6	0 6	0 6	1 2	0 7	0 6	0 8	0 2		0 6	0 8	0 4	0 5	<2	0 4	1 1
Lead	mg/L	*	<0 001	<0 001	<0 001	<0 001	005	<0 001	<0 002	0 007		0 004	0 001	0 002	<0 001	0 6	<0 001	<0 005
Manganese	mg/L	*	0 046	0 308	0 004	0 059	0 227	0 107	0 189	0 206		0 354	0 008	3 46	0 044	0 003	0 035	1 77
Mercury	mg/L	*	<0 000 1	<0 000 1	<0 000 1	<0 000 1	<0 000 1	<0 000 1	<0 000 1	<0 000 1		<0 000 1	<0 000 1	<0 000 1	<0 000 1	<0 000 1	<0 000 1	<0 000 1
Nitrate	mg/L	*	0 01	0 01	< 01	<0 01	0 26	0 01	0 01	0 01		0 04	<0 01	0 01	<0 05	<0 000 1	0 16	<0 01
Nitrite	mg/L	*	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 04	<0 01	<0 01	<0 01	<0 01
OCP	µg/	*	< 05	<0 5	<0 05	<0 5	<0 5	<0 5	<0 5	<0 5		<0 5	<0 5	<0 05	<0 5	<0 01	<0 5	<0 5
OPP	µg/	*	<0 05	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5		<0 5	<0 5	<0 05	<0 5	<0 5	<0 5	<0 5
PAH	µg/	*	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<0 5	<1	<1
Toluene	µg/	*	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2	<1	<2	<2
TPH	µg/	*	<50	<50	<50	<12	50	<50	<50	<50		<50	<50	350	50	<2	<50	<50
Total Phenolics	mg/L	*	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05		<0 05	<0 05	<0 05	<0 05	<50	<0 05	<0 05
Xylene	µg/	*	<2	<2	<2	<2	<2	<2	<2	<2		<1	<2	<2	<2	<0 05	<1	<2
Zinc	mg/L	*	0	0	0	0	0	0	0	0	0	0	0	0	0	<2	0	0

Table 3.1.1(e) Annual analyte testing August 2013 results

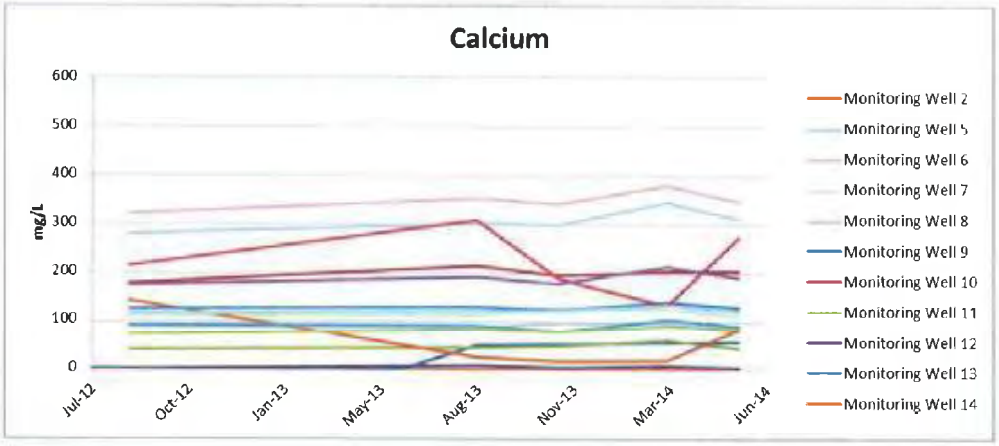
3.1.2 *Data Presentation – Quarterly Monitoring*

Alkalinity results presentation.



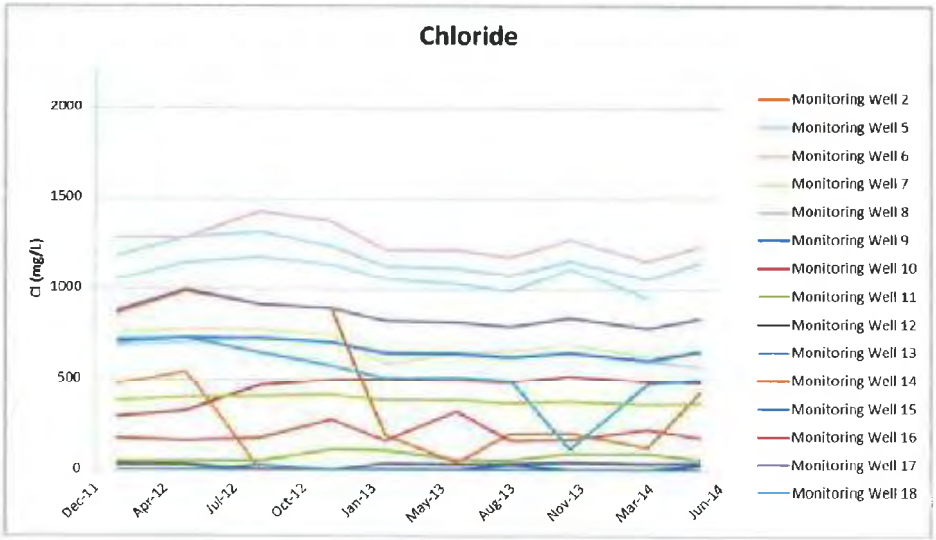
Increased alkalinity levels can be caused by many chemical processes including the denitrification process common in landfill leachate. Denitrification is the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. This process produces calcium carbonate as a by-product. The stability of the calcium carbonate in the groundwater monitoring wells over the three and a half year sample period shows that it is unlikely that the denitrification process caused by leachate ingress is taking place in the groundwater around the site. Nonetheless, the calcium carbonate levels are relatively high and quite "hard" in plumbing terms and continued monitoring is necessary to scrutinise for any increased value trends. It should be noted that many natural groundwater sources often contain much higher alkalinity levels than this site.

Calcium results presentation.



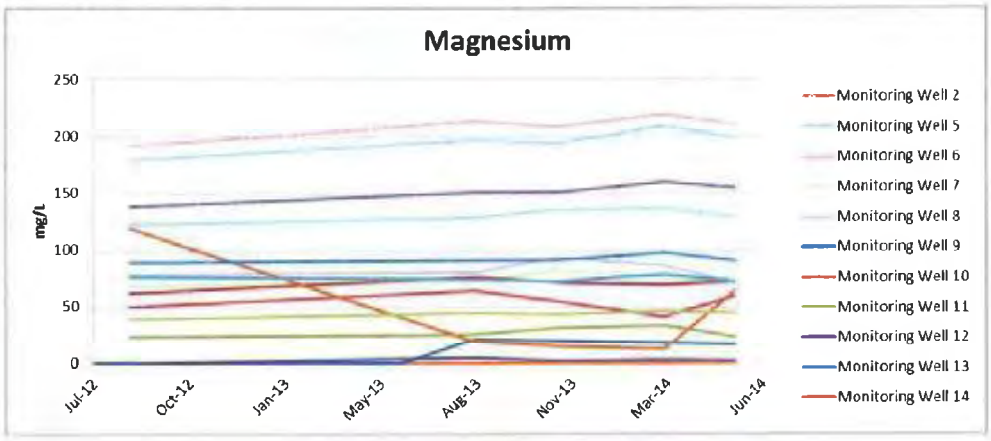
The groundwater monitoring wells show a consistent stable trend for calcium levels. The calcium levels sampled would be considered "hard" water in the region of 120-180mg/L. This is consistent with the presented results for alkalinity.

Chloride results presentation.



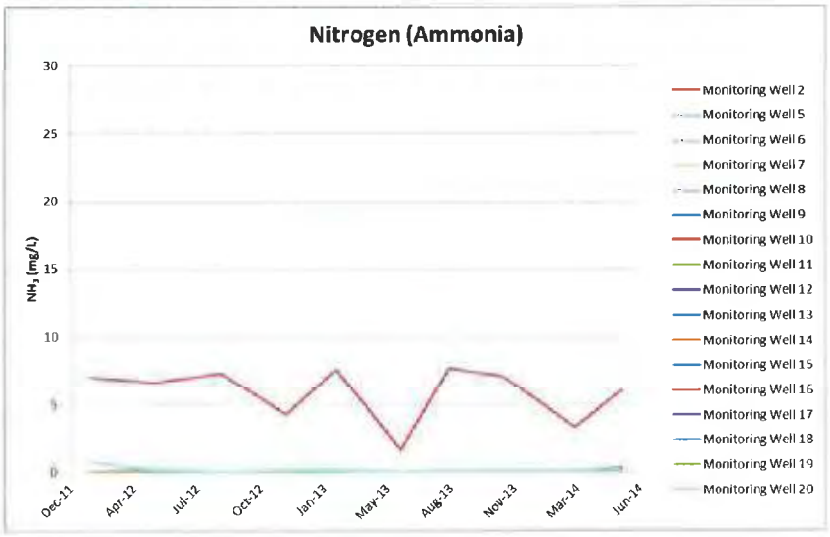
The trends realised through chloride monitoring have been in line with the historical levels over the data range available. Large quantities of inorganic ions such as chloride can be an indicator of leachate contamination of groundwater. A sudden increase in these ions can act as early warning system. The sampling history for chloride suggests that no significant spikes have occurred that has not returned to normal or historical levels and therefore leachate is not indicated in the groundwater network.

Magnesium results presentation.



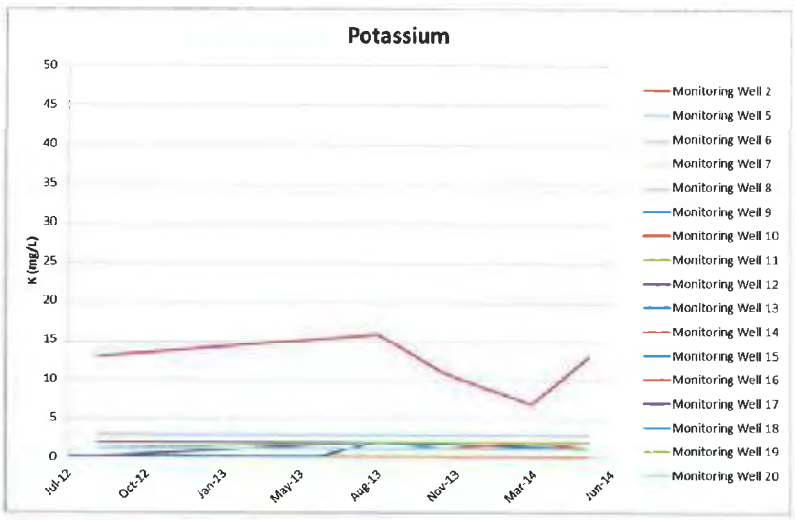
Groundwater monitoring well results are in line with historical levels and have maintained consistent levels. The magnesium levels sampled would be considered quite "hard" and consistent with other typical water hardness measures such as alkalinity and calcium.

Nitrogen as ammonia results presentation.



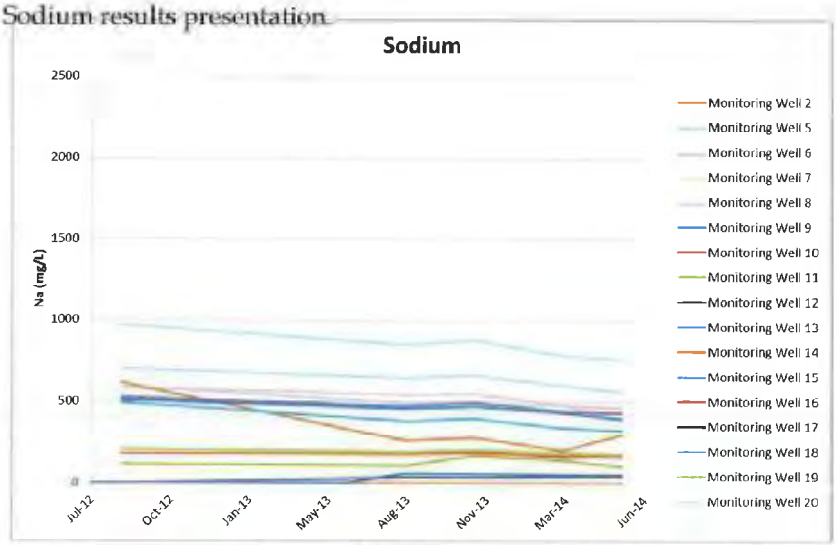
The groundwater monitoring wells indicate that ammonia levels in the groundwater are extremely low and often beneath the testing limits. However, monitoring point 16 has indicated a relatively higher result level. Considering that monitoring points 16 and 19 are arguably the most relevant with regard to groundwater movement from the site, the result must be monitored closely. Ammonia is perhaps the clearest indicator of leachate contamination and the results from monitoring point 16, should be carefully monitored in future sampling events to be sure that the relative higher levels are not indicative of leachate migration.

Potassium results presentation.



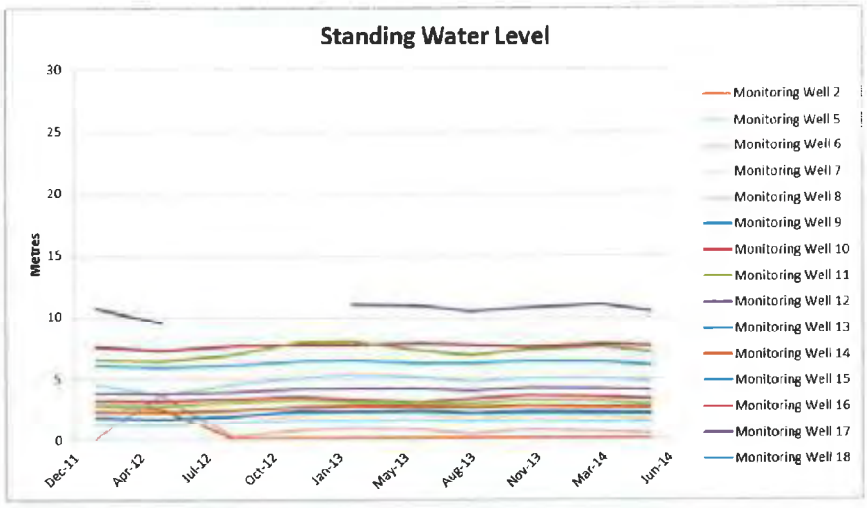
Potassium is present in groundwater systems outside coastal areas generally through weathering of clays and as a result of agriculture (leaching of fertiliser). Potassium may also be present in the breakdown of glass and especially cathode ray tubes. Groundwater monitoring wells indicate that potassium levels in the ground water are generally low over the available results period. Monitoring point 16 is reading higher than all other bores. Additional attention should be given to this location in future sampling events.

Sodium results presentation.



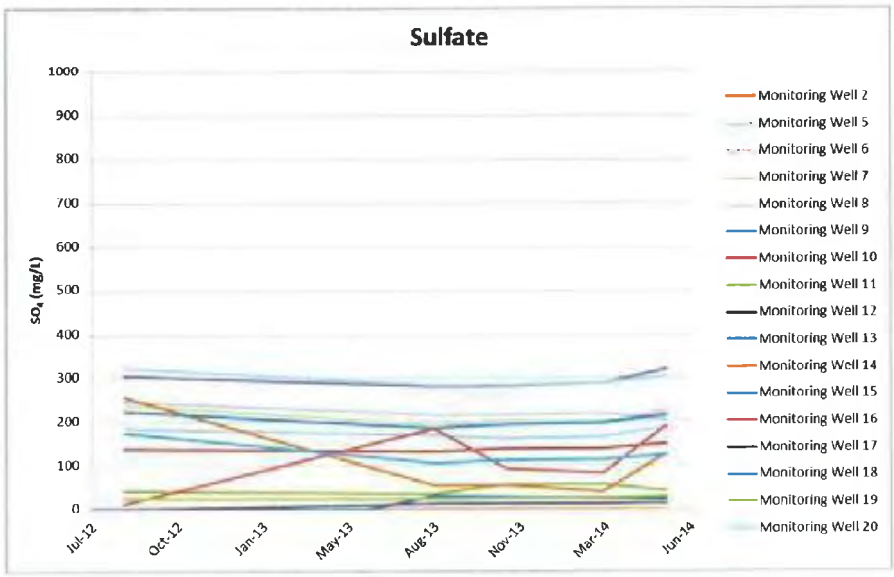
High sodium levels are indicative of leachate contamination infiltrating the groundwater. As presented, results for sodium have been stable over the history of data available. Notable monitoring well 16 is displaying low levels.

Standing water level presentation.



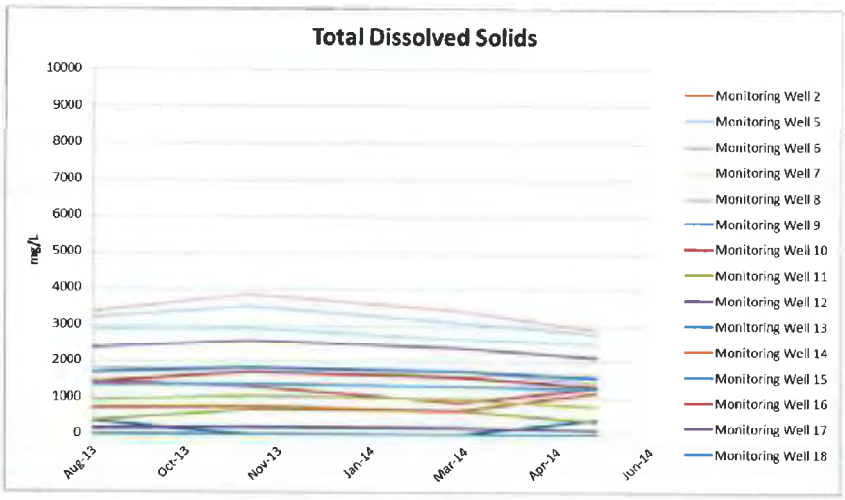
Groundwater level trends have been fairly stable, with the fluctuation over the 4 year testing period. It should be noted that some bores have run dry at periods.

Sulfate results presentation.



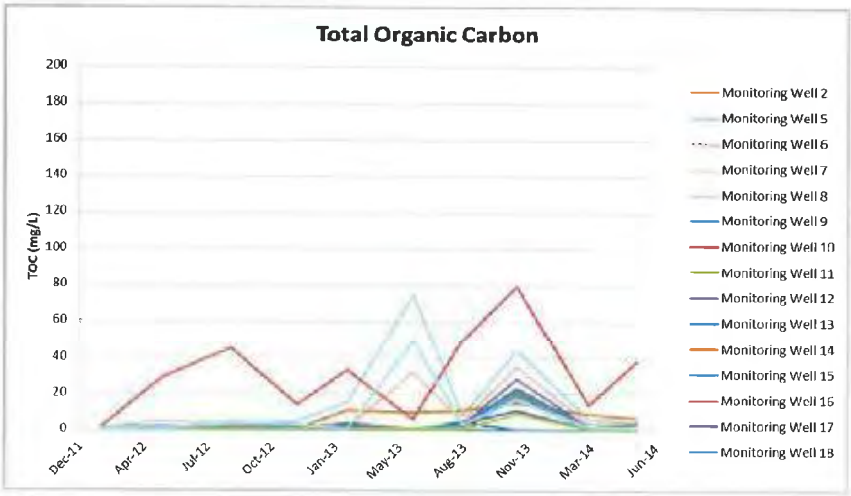
The *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500mg/L. The sulfate levels in the groundwater monitoring wells are in line with the historical levels and are generally below the drinkable water standard. Inorganic ions such as sulfate provide a good indication of groundwater contamination by landfill leachate. A sudden increase in these ions can act as early warning system.

Total dissolved solids results presentation.



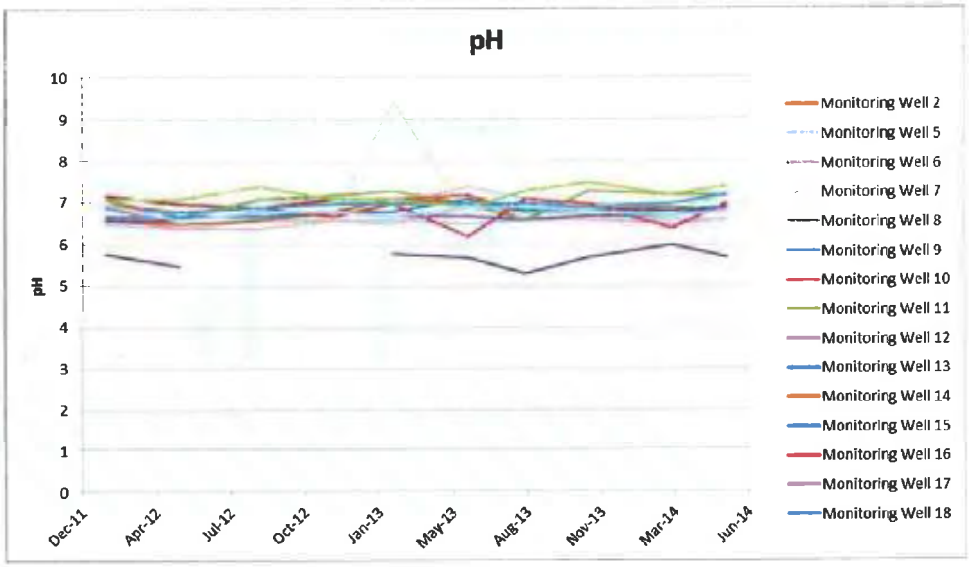
The trend for the quantity of dissolved solids has been fairly stable for the ground water monitoring wells over the reporting period, in line with historical trends. High levels of dissolved solids can be sourced from salts derived from leachate infiltration

Total organic carbon results presentation.



Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of groundwater contamination by organic compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained relatively stable over the three year results period. However, monitoring point 16 requires closer attention for the next sampling periods.

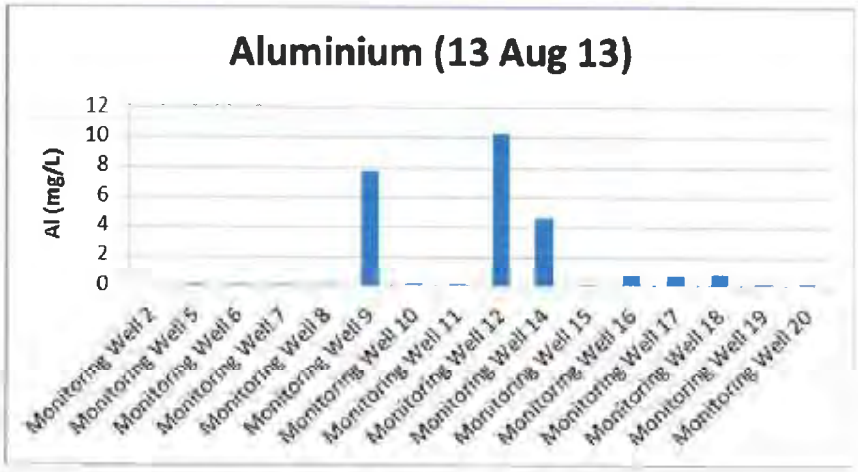
pH results presentation.



The pH levels indicated in the groundwater monitoring wells have been extremely stable over the three year sample period. The fluctuations have been very small except with minor anomalies that invariably return to a stable trend. The groundwater monitoring wells indicate that the historical pH of the groundwater has been maintained over the sample period.

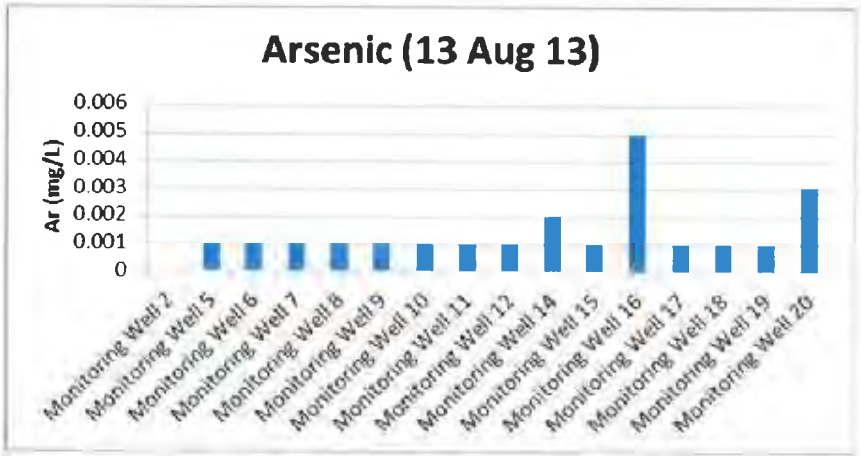
3.1.3 *Data Presentation - Annual Monitoring*

Aluminium results presentation



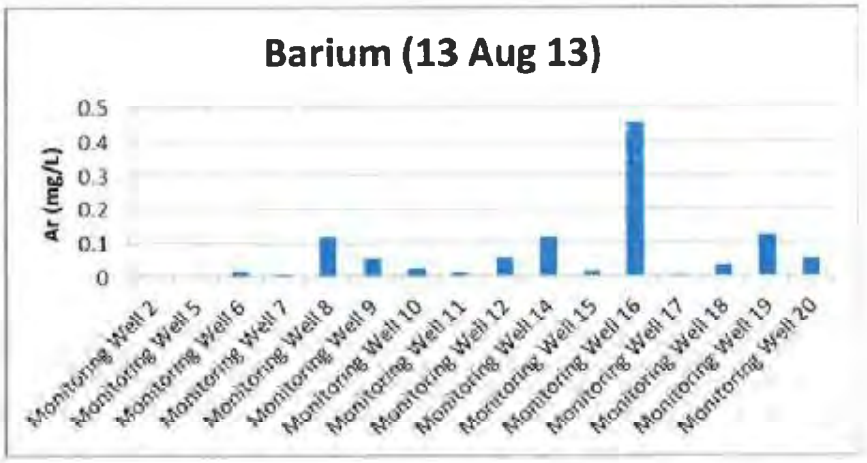
Aluminium levels in the sampled groundwater monitoring points 9, 12 and 14 are relatively higher than the other point's onsite. Anthropogenic sources of aluminium in groundwater are generally related to low pH runoff and colliery based leachate. No trends have developed in the one round of sampling conducted to date.

Arsenic results presentation



The US EPA sets the maximum contaminant level of arsenic in groundwater at 0.05mg/L. Therefore amount of arsenic found in the groundwater monitoring bores over the reporting period is extremely low. In fact arsenic levels are below detectable limits in almost all of the test results.

Barium results presentation

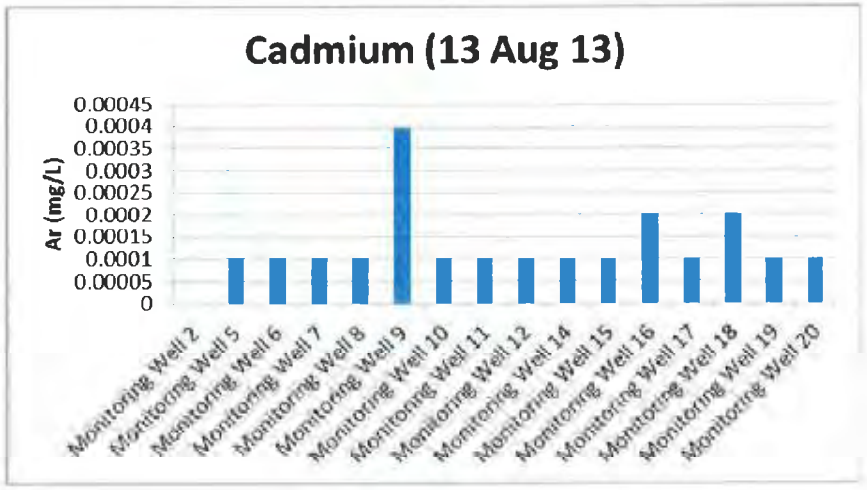


The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 2 mg/L of barium is safe for consumption. Anthropogenic sources of barium in groundwater include bleaches, dyes and drillers mud. Barium levels are therefore extremely low and stable in the sites groundwater.

Benzene results presentation

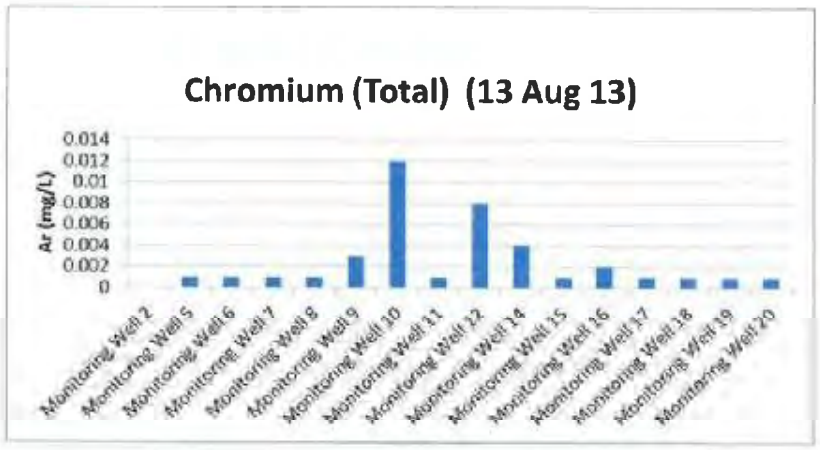
Benzene has not been modelled as every instance of sampling has not provided a result due to the concentration of benzene being below laboratory testing thresholds.

Cadmium results presentation



The US EPA sets the maximum contaminant level of cadmium in groundwater at 0.01mg/L. Cadmium levels present in the ground water monitoring bores is extremely small. Cadmium levels are always below 0.01 mg/L and below detectable limits in the majority of readings taken during the reporting period.

Chromium results presentation

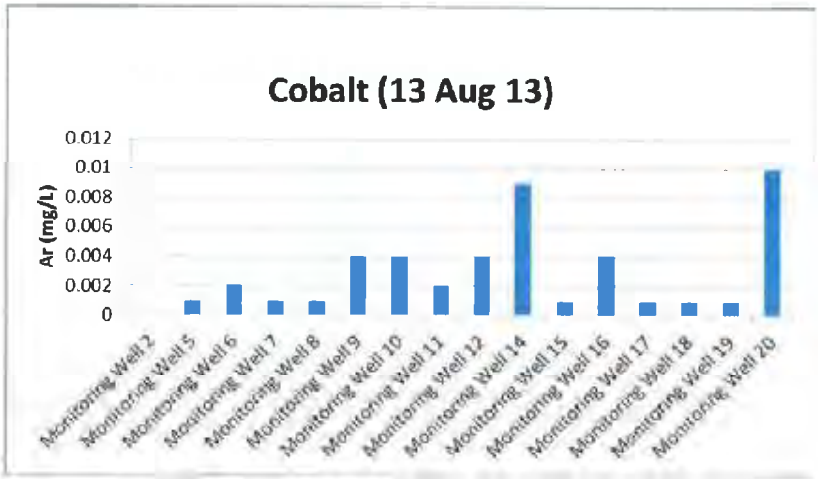


The US EPA sets the maximum contaminant level of chromium in groundwater at 0.05mg/L The levels of chromium detected in the ground water monitoring wells over the reporting period have been extremely low. Chromium levels are below detectable limits in the majority of the samples.

Chromium (hexavalent) results presentation

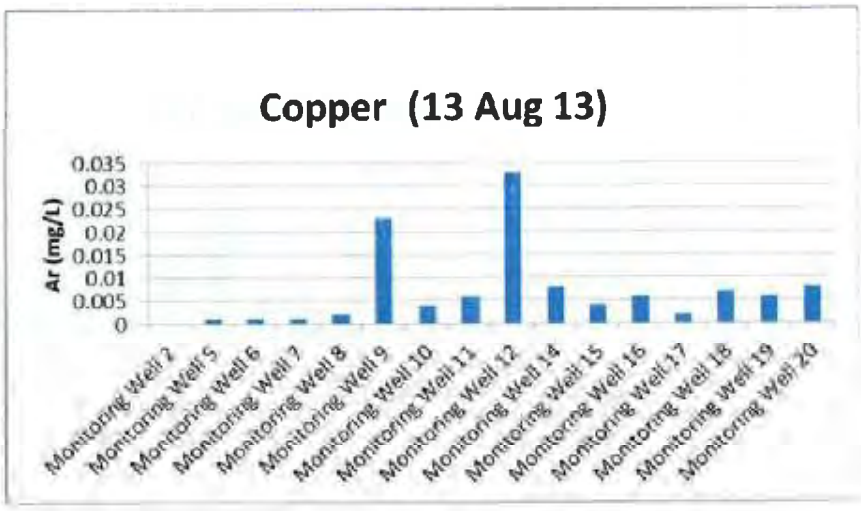
Hexavalent chromium has not been modelled as every instance of sampling has not provided a result due to the concentration of hexavalent chromium being below laboratory testing thresholds.

Cobalt results presentation



Anthropogenic sources of cobalt in the environment include agricultural runoff and sewage effluent.

Copper results presentation

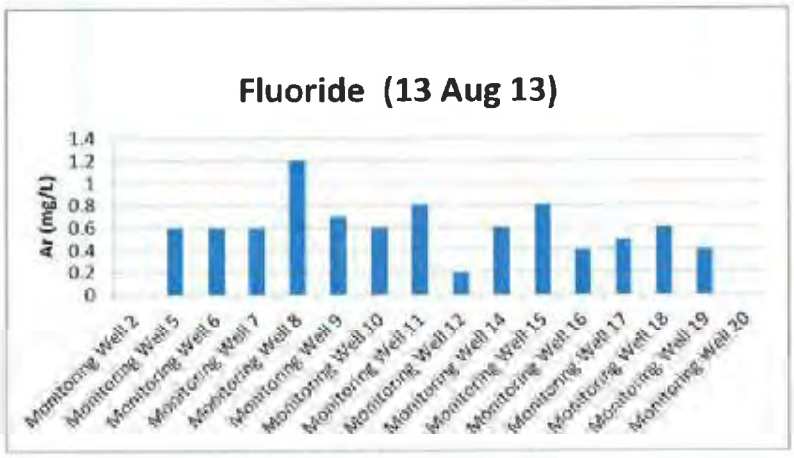


Tested results from the ground water monitoring wells show an extremely small amount of copper. The *2011 Australian Drinking Water Guidelines 6* prescribes an aesthetic limit of 1 mg/L of copper in drinking water. Clearly, the results therefore indicate that copper contamination is not evident.

Ethyl Benzene results presentation

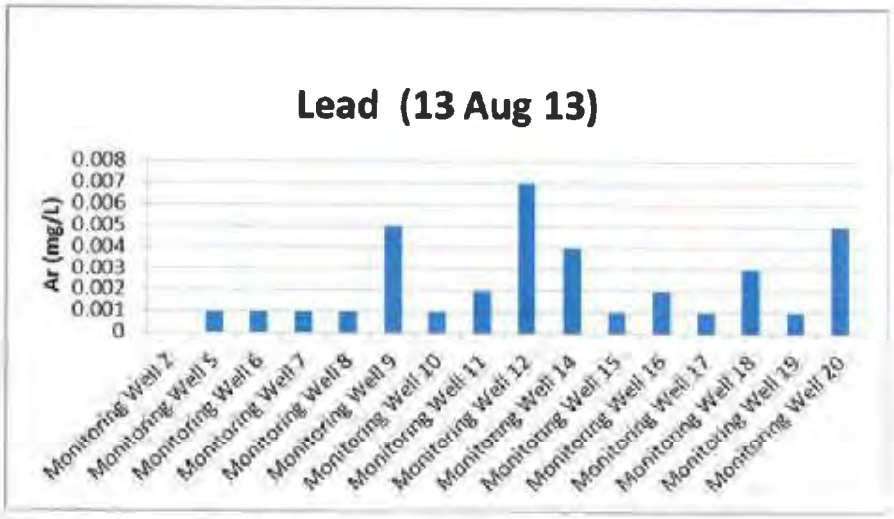
Ethyl benzene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Fluoride results presentation



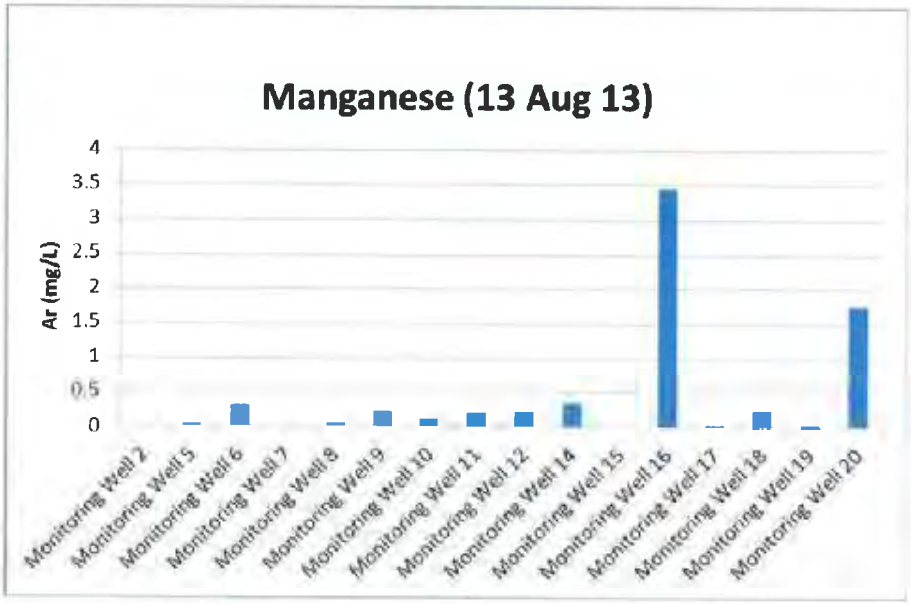
Industrial emissions are understood to be the primary anthropogenic pathway for fluoride to enter the environment. The US EPA sets the maximum contaminant level of fluoride in groundwater at 4 mg/L. Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L.

Lead results presentation



Heavy metal contamination in the groundwater in the form of lead is at very low levels.

Manganese results presentation

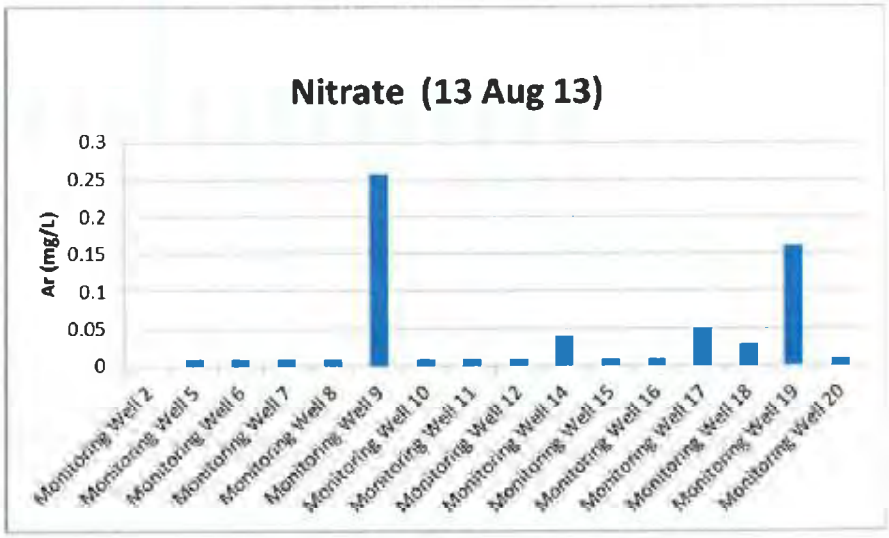


The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 0.5 mg/L of manganese is safe for consumption. Manganese can be a strong indicator of landfill leachate in groundwater leached from hazardous waste sites and often derived from battery disposal. Monitoring points 16 and 20 should be closely monitored in future sampling events.

Mercury results presentation

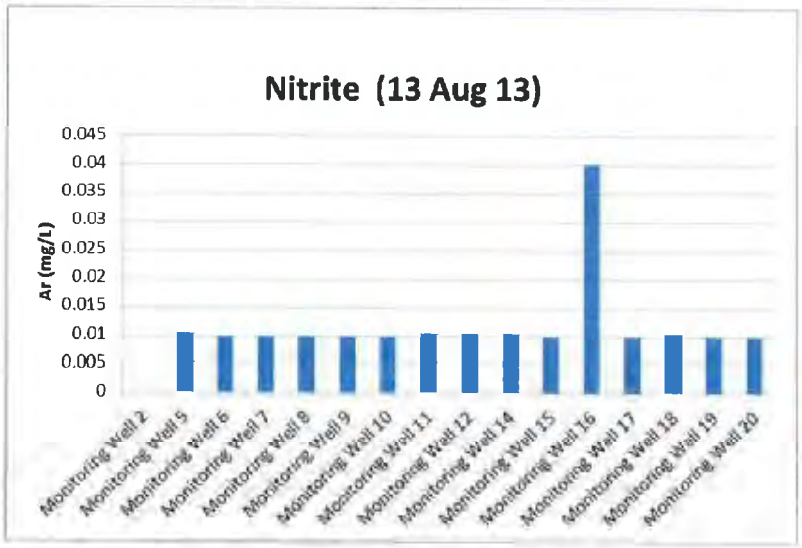
Mercury was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Nitrate results presentation



The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 50 mg/L of nitrate is safe for consumption. Denitrification is a process common in leachate treatment where the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form occurs. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. The relatively low levels of nitrate sampled, indicate that the denitrification process is not evident and landfill leachate is not present in the groundwater.

Nitrite results presentation



Nitrification is a twostep aerobic biological process where bacteria known as nitrosomonas convert ammonia and ammonium to nitrite. Next, bacteria called nitrobacter finish the conversion of nitrite to nitrate. The conversion of nitrite to nitrate is generally very fast and nitrite levels are therefore invariably quite low. More toxic than nitrate, nitrite is an indicator of ammonia (major constituent of landfill leachate) that has not been biologically processed (into nitrate). Nitrite levels above 3 mg/L are considered potentially harmful by the *2011 Australian Drinking Water Guidelines 6*. As demonstrated by the above data presentation, nitrite levels found in the ground water monitoring wells are extremely small and below detectable limits in almost all of the samples taken. However, monitoring point 16 should be given additional attention in future sampling events.

Organochlorine Pesticides results presentation

Organochlorine pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Organophosphate Pesticides results presentation

Organophosphate pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

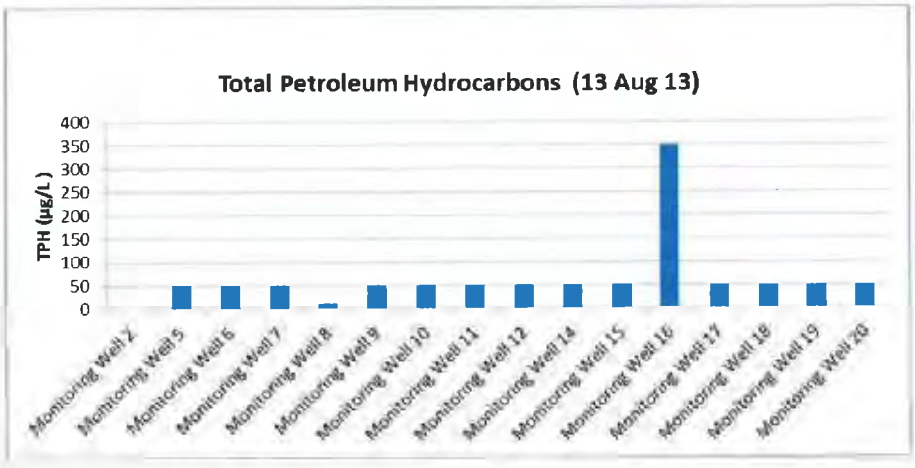
Polycyclic Aromatic Hydrocarbons results presentation

Polycyclic aromatic hydrocarbons were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Toluene results presentation

Toluene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Total Petroleum Hydrocarbons results presentation



Total petroleum hydrocarbons were not detected at any level in the ground water monitoring points during the reporting with the exception of point 16. Point 16 to be further monitored.

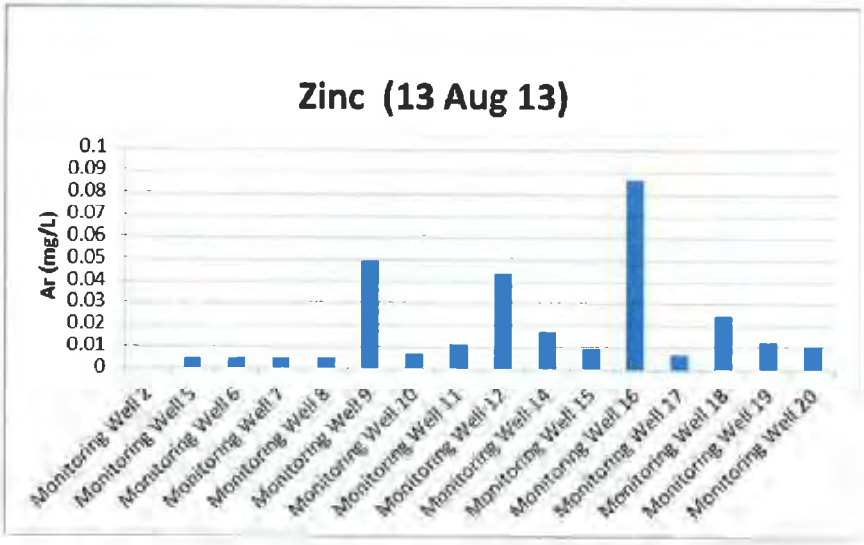
Total Phenolics results presentation

Total phenolics were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Xylene results presentation

Xylene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Zinc results presentation



The *2011 Australian Drinking Water Guidelines 6* states that for aesthetic reasons a maximum of 3 mg/L of zinc is desirable for consumption. Landfill sites can be an anthropogenic source of zinc in groundwater, however despite the extremely low levels of zinc detected monitoring point 16 should be further monitored due to the display of levels higher than the other surrounding points.

3.1.4 *Groundwater Testing Results Interpretation*

Results indicate that there has been no definitive increase in concentration levels for any of the analytes detailed when compared to the historical results and trends. The following table indicates the analytes that should be closely monitored for developing trends over the next twelve months:

Analyte	Monitoring Point	Regime	Next Sample
Nitrogen (Ammonia)	16	Quarterly	August 2014
Potassium	16	Quarterly	August 2014
Total Organic Carbon	16	Quarterly	August 2014
Manganese	16, 20	Annual	August 2014
Nitrite	16	Annual	August 2014
TPH	16	Annual	August 2014
Zinc	16	Annual	August 2014

On reflection, key indicators of landfill leachate's potential ingress into ground water including ammonia, nitrate, nitrite levels and other less poignant indicators as tested do not conclude that that landfill leachate is entering the surrounding ground water system. However, the potentially anomalous results presenting in monitoring point 16 warrant further scrutiny. Pending the results of August 2014 sampling events (quarterly and annual), the monitoring point 16 will be subject of a independent consultants review.

3.2 SURFACE WATER MONITORING

3.2.1 *Tabulated Results*

As per the sites EPL, annual sampling and sampling of each stormwater overflow event was undertaken with the following results:

Analyte	Aug 2013	EPA Monitoring Location		
	Units	1	33	34
Alkalinity	mg/L	501	142	163
Ammonia	mg/L	30.8	0.15	0.01
Calcium	mg/L	54	34	46
Chloride	mg/L	210	66	61
Conductivity	µS/cm	1640	535	594
Dissolved O_2	mg/L	4.66	5.87	8.7
Iron	mg/L	0.67		
Fluoride	mg/L	0.6	0.2	0.3
Magnesium	mg/L	37	17	21
Nitrate	mg/L	0.26	0.6	0.01
Potassium	mg/L	39	<5	3
Sodium	mg/L	177	44	37
Sulfate	mg/L	24	19	34
Temperature	°C	12.4	13.2	12.1
TOC	mg/L	45	5	3
TP	mg/L	<0.05	<0.05	<0.05
TSS	mg/L	154	<5	<5
pH	pH	7.8	7.1	7.6

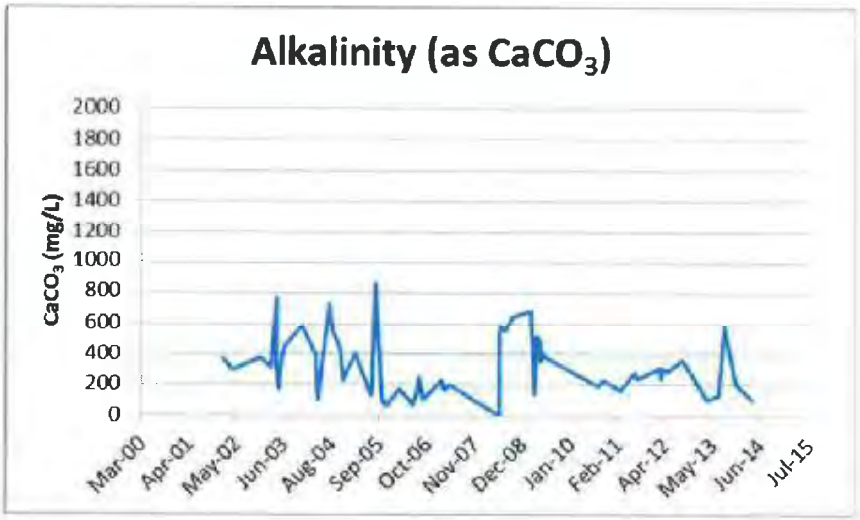
Table 3.2.1 Stormwater overflow monitoring results for the reporting period

Additionally, overflow events were also sampled as per the sites EPL. With the following results:

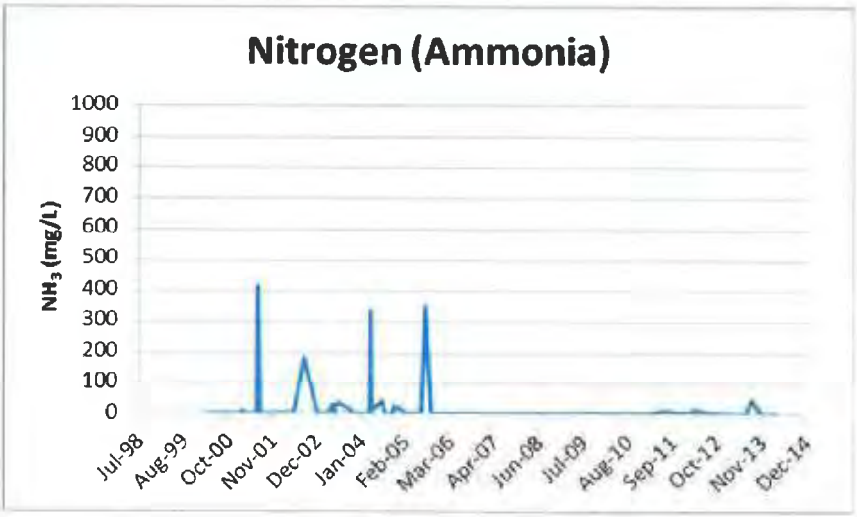
Analyte	Units	EPA Monitoring Point 1		
		28 June 13	18 Nov 13	25 Mar 14
Alkalinity	mg/L	129	207	106
Ammonia	mg/L	1.08	1.23	1.1
Calcium	mg/L	31	29	26
Chloride	mg/L	33	133	47
Conductivity	µS/cm	417	934	391
Dissolved O_2	mg/L	9.08	8.28	686
Iron	mg/L		0.45	0.37
Fluoride	mg/L	0.3	0.4	0.3
Magnesium	mg/L	10	21	18
Nitrate	mg/L	0.08	3.16	1.63
Potassium	mg/L	6	34	13
Sodium	mg/L	34	119	47
Sulfate	mg/L	30	25	31
Temperature	°C	15.4	18.6	22.4
TOC	mg/L	12	28	12
TP	mg/L	0.05	0.05	0.05
TSS	mg/L	26	98	526
pH	pH	7.6	8.2	6.8

3.2.2 *Data Presentation*

Alkalinity results presentation.

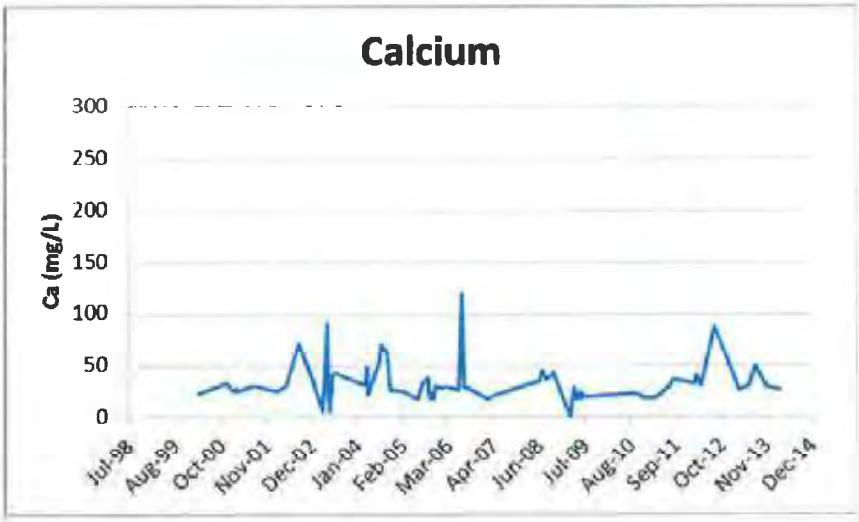


Ammonia results presentation

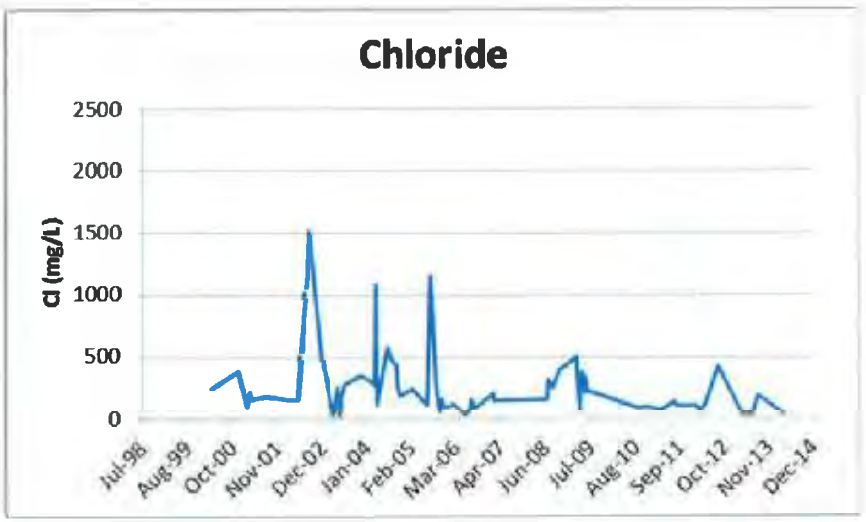


Increased alkalinity and ammonia levels can be caused by biological reactions in landfill leachate. The stability of results, particularly in regard to the reporting period indicates that leachate does not appear to be affecting the stormwater pond. The relatively high alkalinity levels coincide with natural groundwater levels in the area.

Calcium results presentation

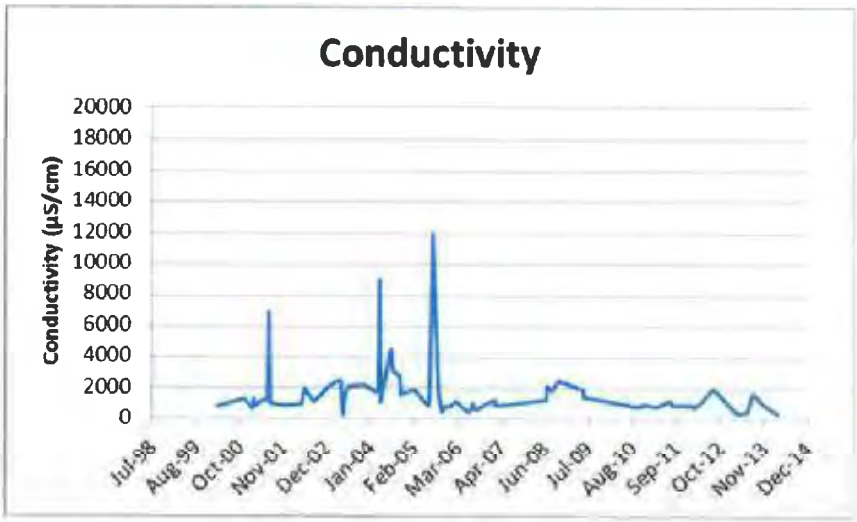


Chloride results presentation

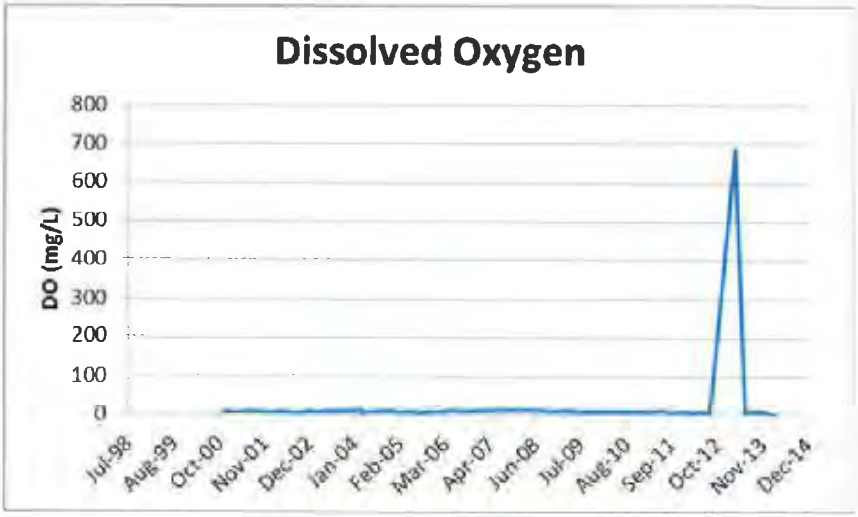


The calcium and chloride levels in the stormwater pond are invariably better than historical results. The levels sampled are also in line with the results sampled throughout the surrounding groundwater system.

Conductivity results presentation

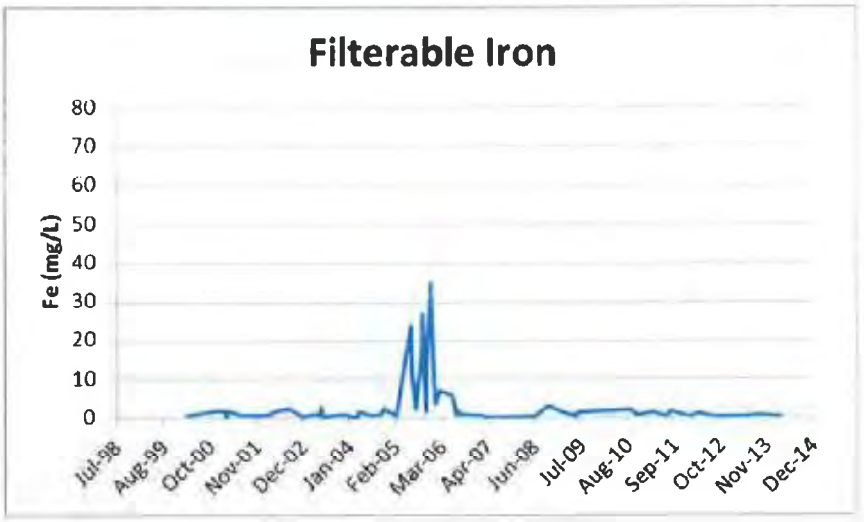


Dissolved oxygen results presentation

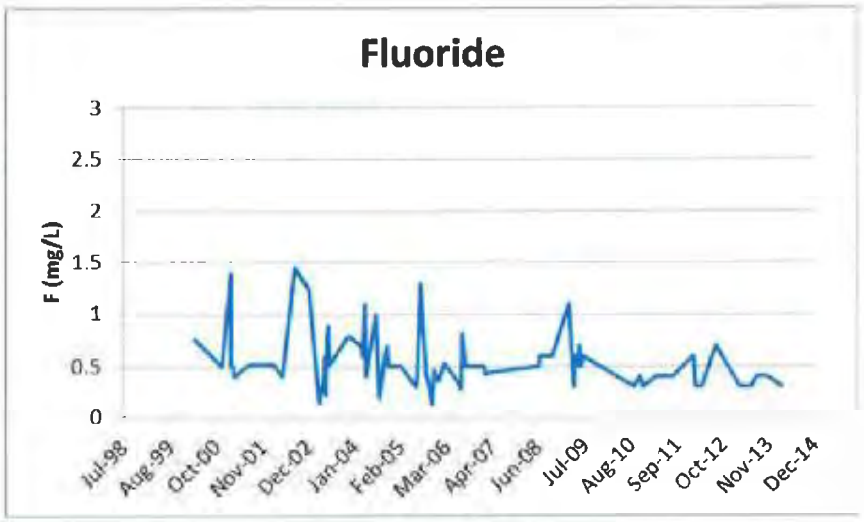


Conductivity is a measure of the waters ability to pass electrical current, usually though positively or negatively charged inorganic dissolved solids (e.g. sodium, magnesium, calcium, iron). The conductivity results for the stormwater detention pond have been stable and trending downwards. Dissolved oxygen levels can be depleted by biological activity associated with the nitrification process. The dissolved oxygen levels have been stable over the history of available results with the exception of a very high result in 2013, that has since returned to historic levels.

Filterable iron results presentation



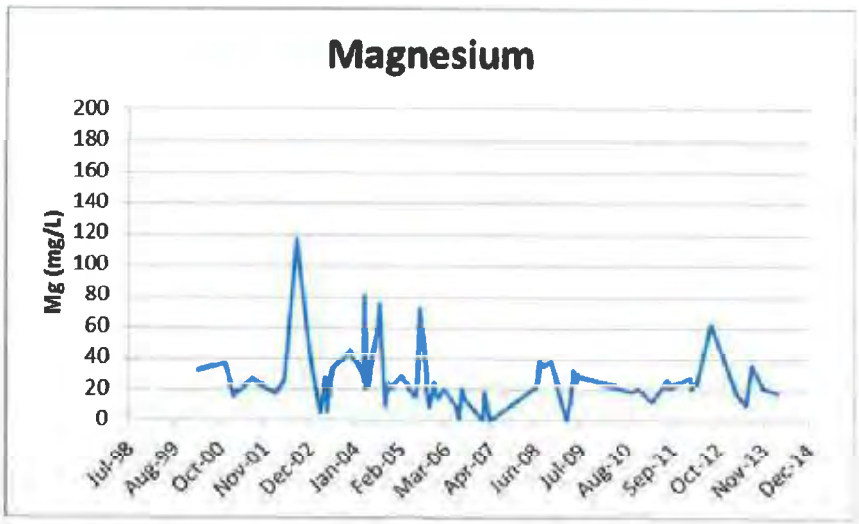
Fluoride results presentation



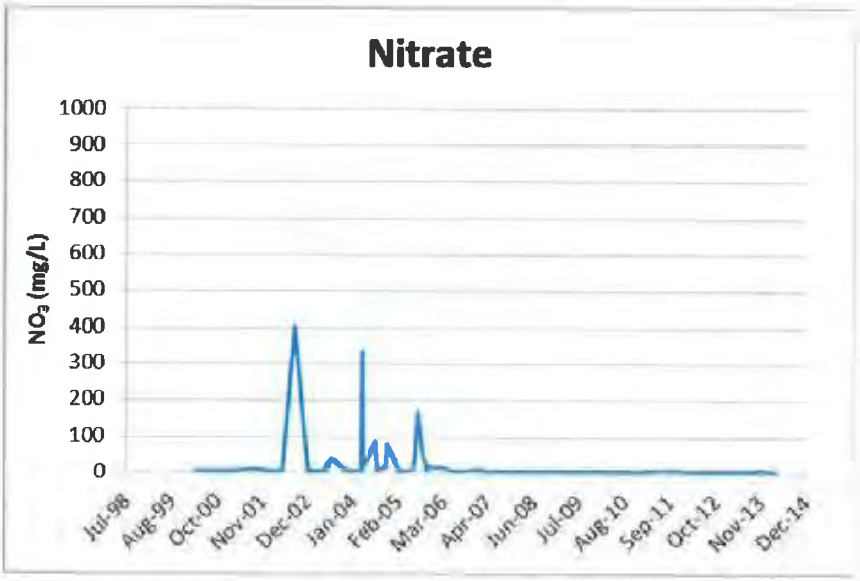
Filterable iron and fluoride have continued to trend at very low levels, especially with regard to the reporting period.

Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L. The level of fluoride found in the stormwater detention pond is therefore relatively low and displays a consistent trend over the twelve year sampling period.

Magnesium results presentation

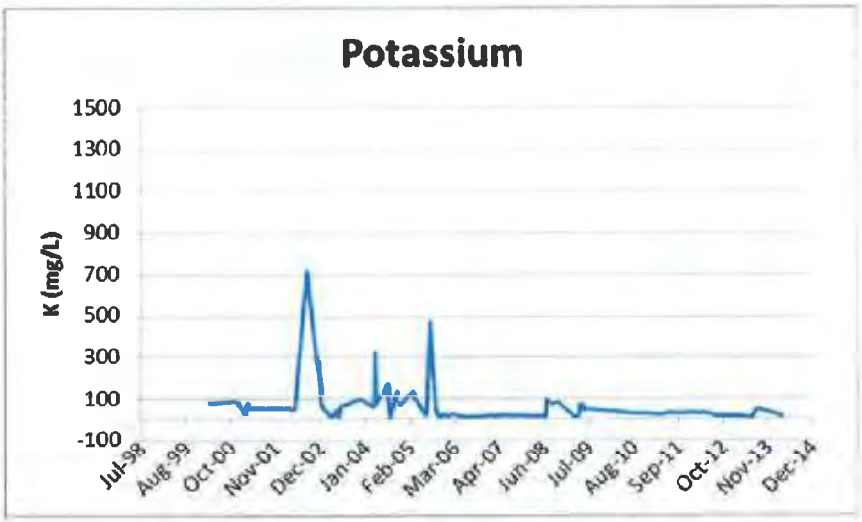


Nitrate results presentation

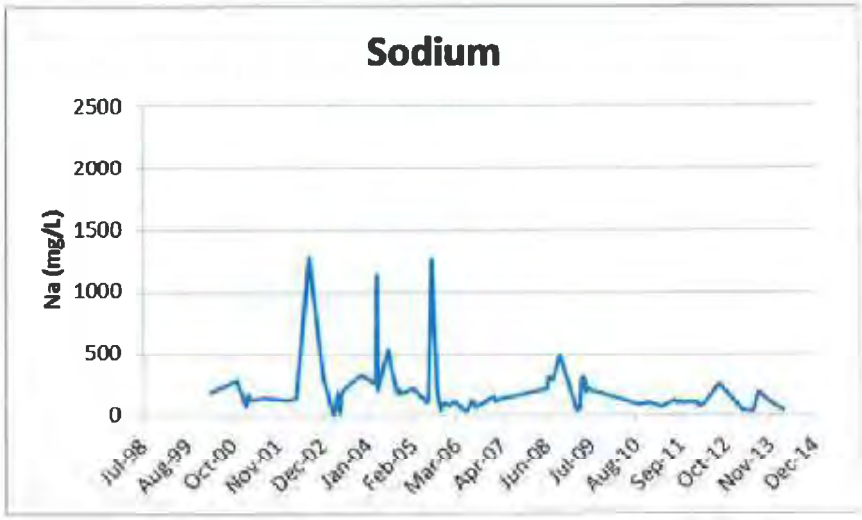


The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 50 mg/L of nitrate is safe for consumption, whilst magnesium is considered as "soft" in the range of 0-60 mg/L. The relatively low levels of nitrate and magnesium sampled indicate that landfill leachate is probably not present in the stormwater detention pond.

Potassium results presentation

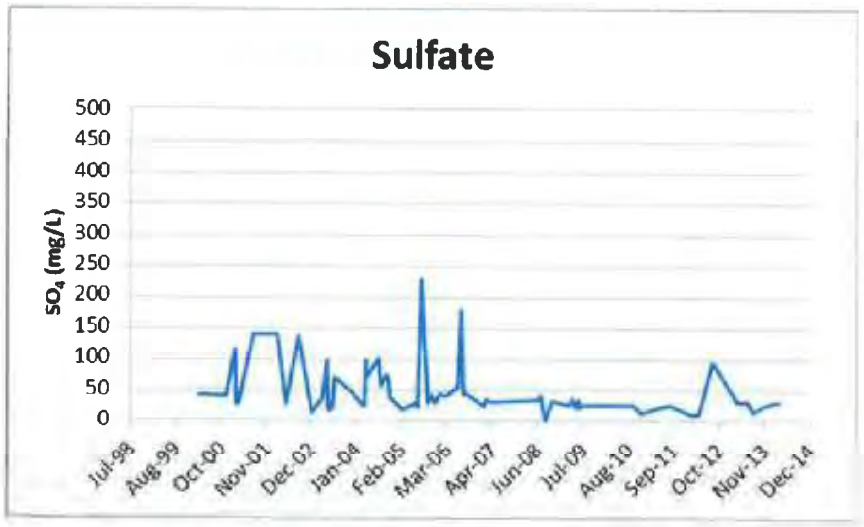


Sodium results presentation



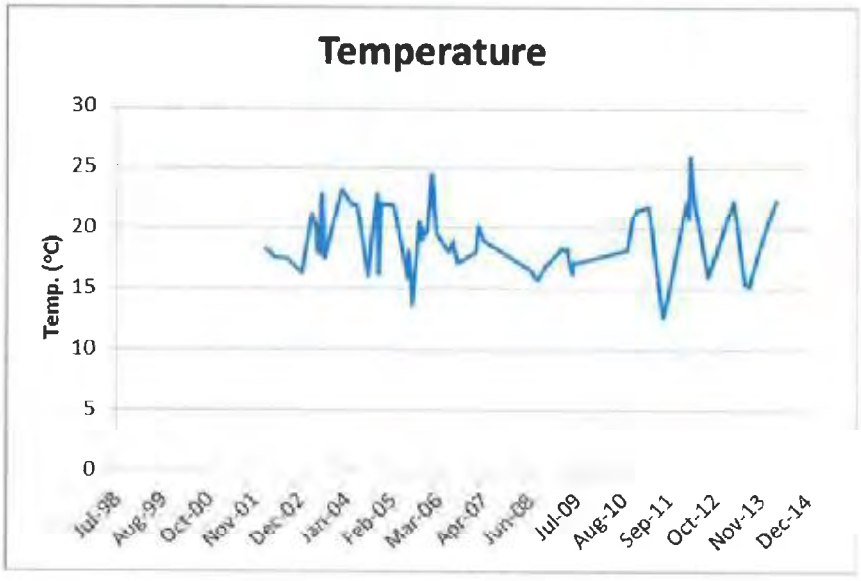
Potassium and sodium concentrations have been in line with recent trends and with the naturally occurring groundwater levels of these analytes around the site. Both analytes have trended downwards in recent years.

Sulfate results presentation



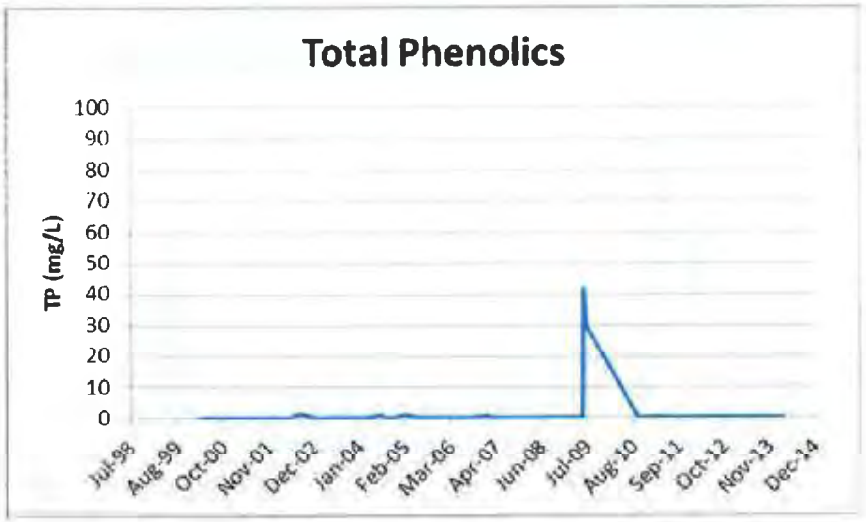
The *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500 mg/L. The sulfate levels in the stormwater detention pond are in line with the historical levels and are better than the drinkable water standard. Inorganic ions such as sulfate provide a potential indicator of groundwater contamination by landfill leachate. A sudden increase in these ions can act as early warning system.

Temperature results presentation



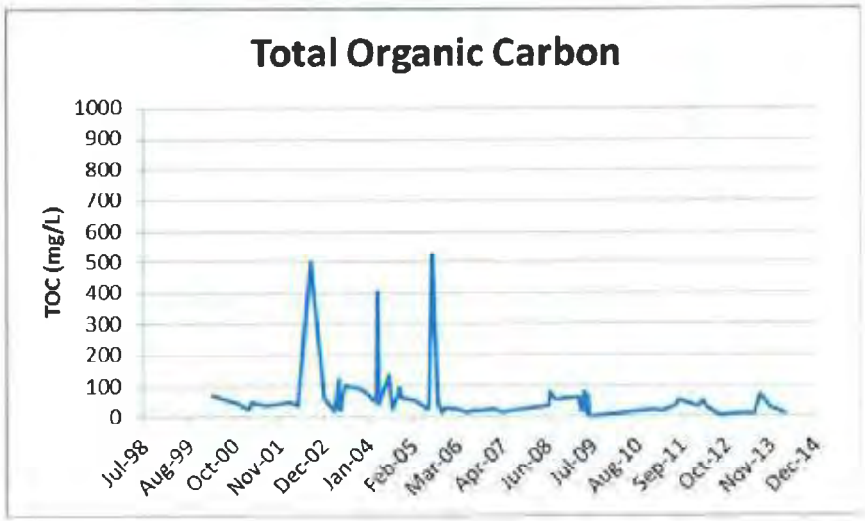
Temperature, as expected has generally been indicative of the season in which the stormwater detention pond has been sampled.

Total phenolics results presentation



Total phenols are widely used in the manufacture of resins, plastics, insecticides, explosives, dyes, and detergents. It is also used as a raw material for the production of medicinal drugs such as aspirin. Historical results for total phenols have been extremely low and more often than not, below detectable limits in the stormwater detention pond. In fact, all samples taken during the reporting period were below detectable limits.

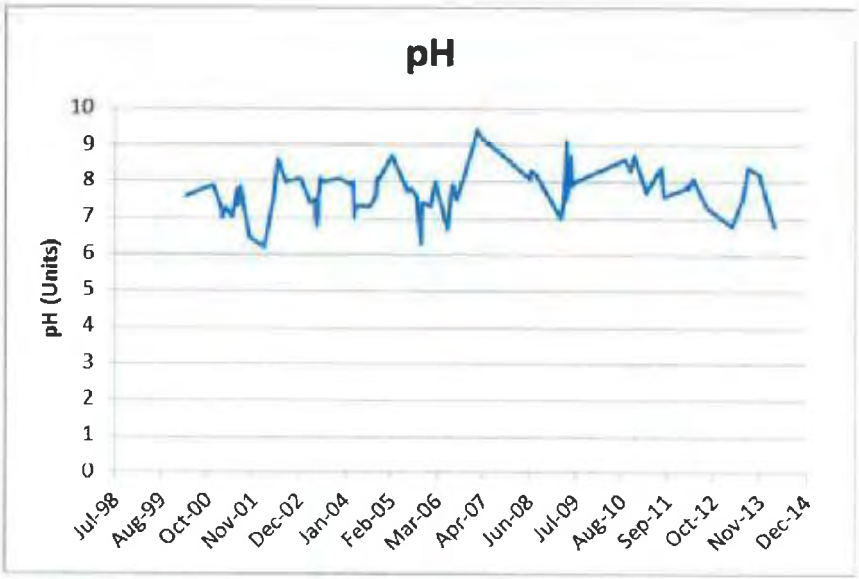
Total organic carbon results presentation



Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of water contamination by natural compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained consistently stable over the last nine years.

Total suspended solids results presentation

pH results presentation



The detention pond analytes measured at the site show relatively low levels of suspended solids and consistent pH levels in the surface water. The suspended solids levels were somewhat inconsistent in the 2008-2009 period, with the amount of solids suspended in the stormwater fluctuating. More modern results indicate that the stormwater pond is functioning effectively with the exception of a peak in March 2013.

3.2.3 *Surface Water Results Interpretation*

From the analytical results it can be demonstrated that the sites sediment and stormwater pond infrastructure are performing adequately and as desired.

3.3 AIR EMISSIONS MONITORING

3.3.1 Tabulated Results

Date	Results Above Recommended Threshold 500ppm	Accumulation Above Recommended Threshold 1250ppm
Jun-13	0	0
Jul-13	0	0
Aug-13	0	0
Sep-13	1	0
Oct-13	0	0
Nov-13	0	0
Dec-13	0	0
Jan-14	0	0
Feb-14	0	0
Mar-14	0	0
Apr-14	0	0
May-14	0	0

Table 3.3.1 Methane monitoring results for the reporting period

Presented results are the number of individual sample results derived from monthly testing that are above the EPA Benchmark Technique recommended threshold levels for further action regarding surface emissions (500 ppm) and accumulation levels (1,250 ppm).

3.3.2 *Data Presentation*

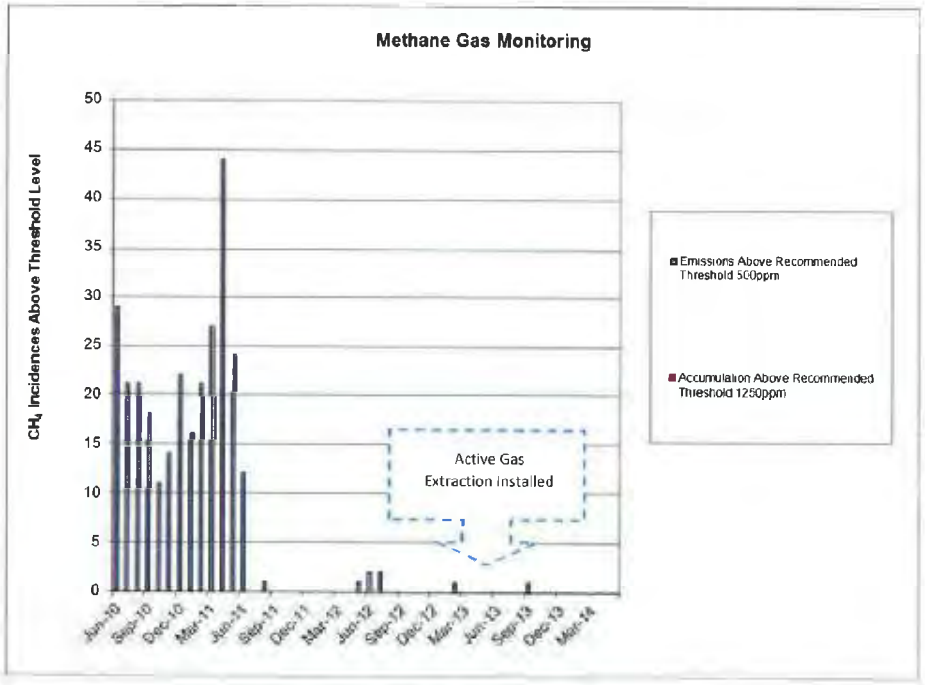


Figure 3.3.2 Air emissions test results above benchmark recommended threshold levels presentation

There is no evident trend for methane gas emissions from the landfill surface. No accumulation levels above the recommended benchmark threshold were found.

3.3.3 *Air Emissions Monitoring Results Interpretation*

During the period 2011-2012 results sampled by GHD showed continued occurrences of surface methane emissions above the EPA recommended threshold levels. A more recent contract awarded to a NATA approved laboratory (ALS Environmental) has shown that the GHD recorded levels were potentially overstated. Both companies state that the accumulation monitoring clearly shows that the methane is not migrating offsite.

Despite the differences in sample results, the site has the potential to generate relatively high amounts of landfill gas, namely methane that must be dealt with. Accordingly, Council commenced installation of methane gas extraction infrastructure. In fact, Phase 1 (covering the older western gully) of the landfill gas management is in place and connected to a flaring unit. Phase 2 (capturing the newer and current eastern gully) has been fully constructed. Commissioning is simply awaiting the finalisation of safety mitigation processes and infrastructure. The final Phase 3 gas collection system will

include infrastructure within the waste filling of the new landfill cell at the WWARRP. Contract procurement is currently underway.

It should be noted that Council has not attempted to rehabilitate the areas prone to surface gas emissions as it would increase the possibility of those somewhat controlled emissions finding a new path of least resistance and becoming uncontrolled.

3.4 ENVIRONMENTAL COMPLAINTS

3.4.1 *Tabulated Results*

Year	Environmental Complaints
2000/2001	0
2001/2002	99
2002/2003	66
2003/2004	19
2004/2005	36
2005/2006	19
2006/2007	22
2007/2008	21
2008/2009	9
2009/2010	12
2010/2011	12
2011/2012	48
2012/2013	59
2013/2014	48

Table 3.4.1 Tabulated complaints for the reporting period and historically

3.4.2 *Data Presentation*

Figure 3.4.2 Environmental complaints results

Environmental complaints have generally trended downwards until the previous three reporting periods where a spike has occurred.

3.4.3 *Environmental Complaints Results Interpretation*

The overlying trend for environmental complaints had been downward after closure of the solid waste energy recovery facility in 2004. However, the previous three reporting periods have given rise to a spike of approximately 150 complaints, invariably regarding perceived odour from the WWARRP. It should be noted that Council commenced community engagement over a new landfill cell development at Whytes Gully coinciding with the 2011/12 year complaints spike.

For additional clarity of the potential causes in the spike of complaints over the previous reporting periods, Figure 3.4.3 is provided.

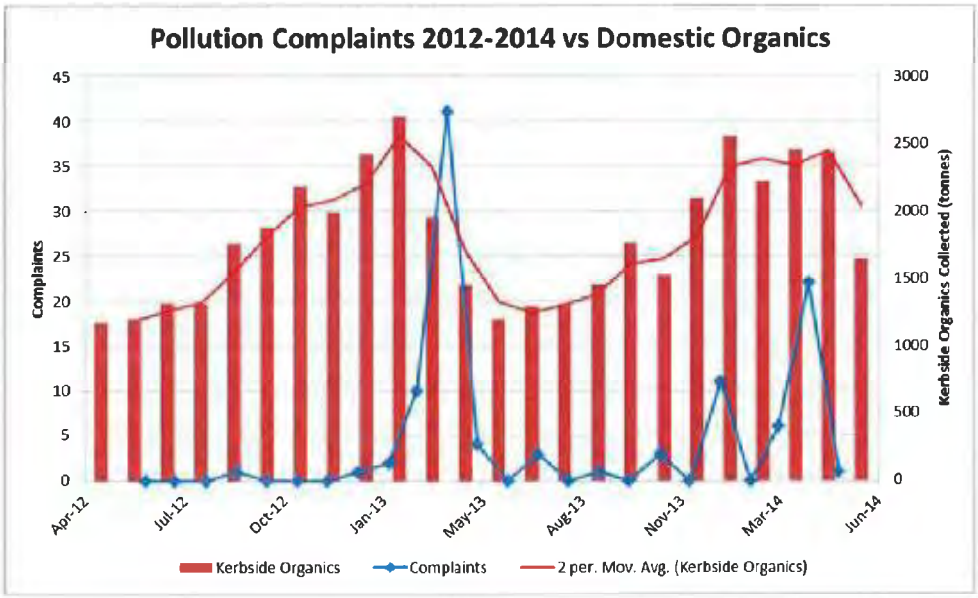


Figure 3.4.3, Pollution Complaints (Odour) vs Domestic Organic Waste Production

As detailed by a blue line in the Figure 3.4.3 (over a two year period), the majority of complaints have been received during late summer and into the autumn season.

The chart also demonstrates in red columns the tonnage of organic waste collected by Wollongong City Council in the kerbside collections. The red line above the columns indicates a non-linear fitted trend curve.

It can be noted from Figure 3.4.3 that complaints align almost perfectly with the increase trend for kerbside organic waste collected. It is also worthy of noting that the green waste is not received at the WWARRP and is instead received at a nearby site also located on Reddalls Road at Kembla Grange.

Complaints received during autumn 2013 were directed to Council and only upon follow up with each individual resident was Council able to conclude that the vast majority did not know about other processing facilities on

Reddalls Road at Kembla Grange. Despite this, the majority of residents opined that as a whole Council is still responsible for ensuring odour in its governance area is minimised.

More recently, in May 2014 Council received two EPL breach notices with fines attached due to the breaches causing uncontrolled odour emissions outside of Council's site boundary. Council acknowledged its indiscretions, namely:

- Excavating waste without approval (in order to bury bulky items sourced from previous flooding within Wollongong's LGA).
- Not providing an odour mitigation strategy for excavation works approved as part of the new landfill cell development.

Council immediately acted upon the aforementioned indiscretions by retraining staff in site procedures (including the process for placing special wastes) and urgently compelling Councils new landfill cell project managers to develop and comply with odour mitigation plans for construction works. Further, Council has developed (in liaison with the EPA) a revised environment complaints procedure that will compel Council to response more quickly in the future and ensure that uncontrolled odour emissions derived from Whytes Gully are investigated and acted upon as a priority.

Whilst Council is confident that there will be no repeat of the incidents that resulted in breach notices, the evidence provided in Figure 3.4.3 suggests that Council's actions may not be 100% effective in eliminating future odour complaints during the late summer and autumn period.

4 SITE SUMMATION

4.1 DEFICIENCY IDENTIFICATION & REMEDIATION

4.1.1 *Surface Methane Emissions above Recommended Benchmark Threshold Levels*

As discussed in Section 3.3.3, the site has historically possessed some previously landfilled areas that emit methane gas above the EPA's recommended benchmark level for further investigation into surface gas emissions. Council has not attempted to cap these areas so that the peak emissions locations are identified and so that the possibility of offsite migration is nullified. Council has trialled a biofiltration type system to attempt to reduce the methane emissions from identified peak areas. However, in February 2013 Council commenced installation of a gas extraction system. The gas management system and its future developments are expected to address the gas emission issues that have historically arisen from time to time at the WWARRP. In conjunction with the gas extraction system, additional subsurface sampling points have been recently installed. These points are now included in sampling regimes.

4.1.2 *Boreholes Indicating Potentially Imperfect Trend Stability*

As discussed in Section 3.1.4, borehole 16 has provided individual and incidental analytical results that require an increased level of scrutiny upon future measurements to ensure negative trends are not establishing. Whilst it is common for individual analytical results to vary from time to time, the prudent course of action is to provide an increased level of vigilance for these analyte and borehole combinations until such time the results return to historic levels or further action is required.

4.1.3 *Dry and Destroyed Boreholes*

During the current sampling period, monitoring points 9 and 13 had a propensity to become "dry" and monitoring point 2 was accidently destroyed by a contractor. To rectify this, Council in association with Golder Associates and the EPA have developed a new groundwater monitoring regime with many a revised structure and analyte sampling regime that collectively replaces the regime detailed in this report. It is anticipated that Council will submit this report for the EPA's consideration in the near future. It is anticipated that the revised program will provide far more relevant results for site investigations and future actions.

4.2 CONCLUSION

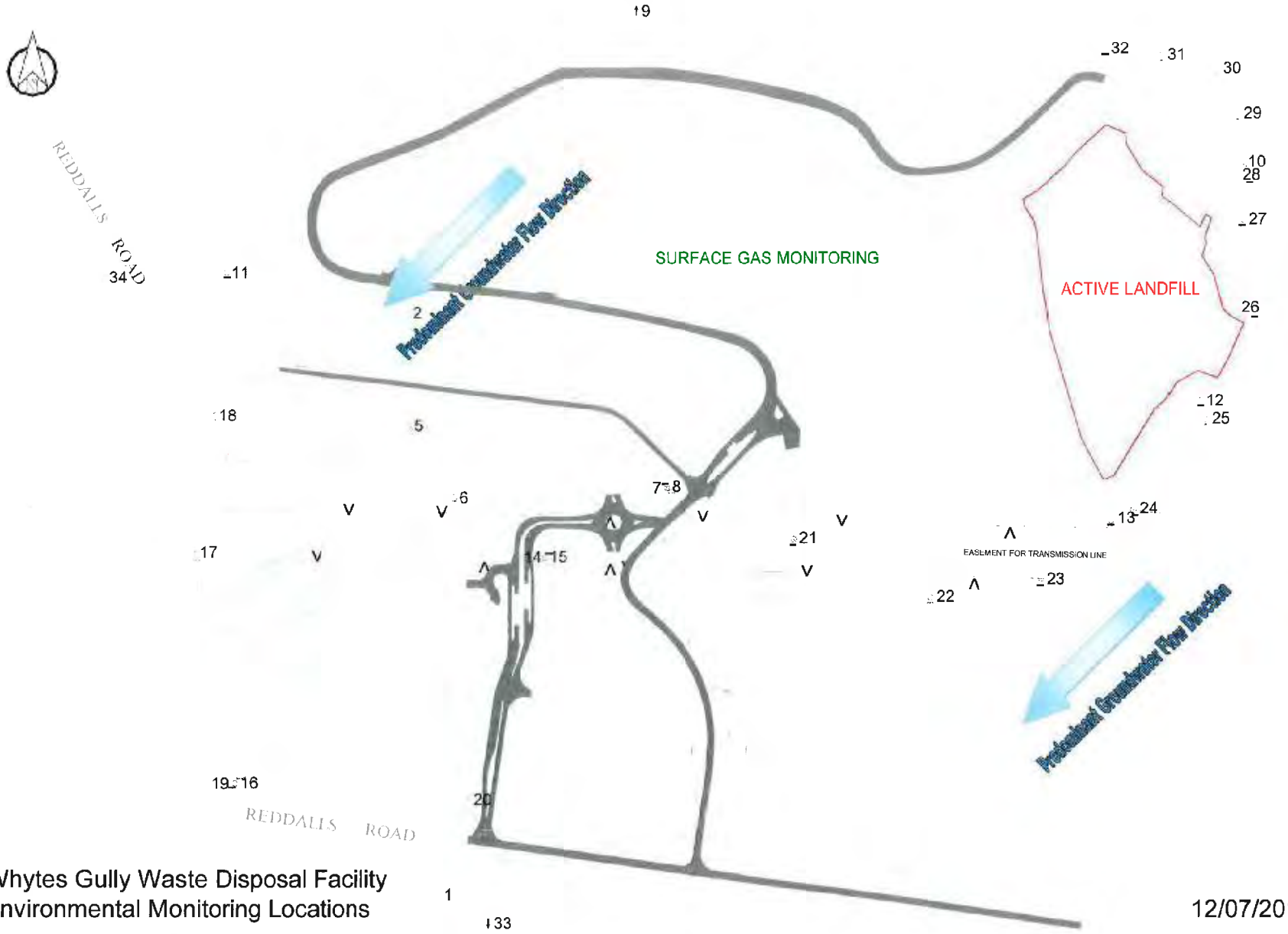
The site is performing well within the individual criteria and limits assigned to it in regard to environmental performance. The low number of deficiencies and nil non compliances (with the exception of the two breach notices issued during the reporting period) shows that Council has maintained satisfactory environmental performance. Actions have already commenced to improve the sites performance in regard to the identified deficiency in Section 4.1.1, which will ensure Council's goal of continuous environmental improvement at Whytes Gully is achieved.

Further, modernised test regimes already implemented and to be further refined in the next reporting period alongside the almost complete new cell development will provide a far better reflection of the state of the environment affected by the site. Consequently, environmental performance trend analysis and analytical results with be more pertinent as the new cell develops.

Annexure A

A Environmental Monitoring Locations

Environmental Monitoring Locations



Whytes Gully Waste Disposal Facility
Environmental Monitoring Locations

12/07/2014

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

ANNUAL RETURN

LICENCE NO	**5862**
LICENCE HOLDER	WOLLONGONG CITY COUNCIL
REPORTING PERIOD	29-May-2013 to 28-May-2014

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual Return relates below:

REVISED REPORTING PERIOD ____ / ____ / ____ **to** ____ / ____ / ____

(Note: the revised reporting period also needs to be entered in Section E)

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA ON OR BEFORE 27-Jul-2014

Your Annual Return must be completed, including certification in Section E, and supplied to the EPA no later than 60 Days after the end of the reporting period for your licence.

Failure to submit this Annual Return within 60 days after the reporting period ends may result in:

- **the issue of a Penalty Notice for $750 (individuals) or $1500 (corporations);**

OR

- **prosecution.**

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

THERE IS A MAXIMUM PENALTY OF $250,000 FOR A CORPORATION OR $120,000 FOR AN INDIVIDUAL.

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997*

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Use the checklist below to ensure that you have completed your Annual Return correctly.
(✓ the boxes)

CHECKLIST		
☐	Section A:	All licence details are correct
☐	Section B1:	You have entered the correct number in the complaints table
☐	Section B2 – B3:	If there are tables, you have provided the required details
☐	Section C:	You have answered question 1, and 2 if applicable
☐	Section D:	If applicable, you have completed all load calculation worksheets
☐	Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☐	Section F:	You have answered question 1, 2 and 3 if applicable
☐	Section G:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
☐	Make a copy of the completed Annual Return and keep it with your licence records	
☐	Attach a cheque (unless you have paid separately) for the payment of the administrative fee for the next licence fee period	

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

'Annual Return

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NSW EPA

A Statement of Compliance - Licence Details

ALL licence holders must check that the licence details in Section A are correct

If there are changes to any of these details**you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.**

Licence variation and transfer application forms are available on the EPA website at: http://www.epa.nsw.gov.au/licensing or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700.

If you are applying to vary or transfer your licence you must still complete this Annual Return.

A1 Licence Holder

Licence Number	5862
Licence Holder	WOLLONGONG CITY COUNCIL
Trading Name *(if applicable)*	
ABN	63 139 525 939

A2 Premises to which Licence Applies (if applicable)

Common Name (if any)	WHYTES GULLY WASTE DISPOSAL FACILITY
Premises	REDDALLS ROAD KEMBLA GRANGE NSW 2526

A3 Activities to which Licence Applies

Waste Disposal (application to land)

A4 Other Activities (if applicable)

A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Waste disposal by application to land		annual capacity

A6 Assessable Pollutants (Not Applicable)

B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

Number of complaints recorded by the licensee during the reporting period **If no complaints were received enter nil in the attached box, otherwise complete the table below.**	

Pollution Complaint Category	Number of Complaints
Air	
Water	
Noise	
Waste	
Other	

B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is **not** required by your licence, **no tables** will appear below.
Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Discharge & Monitoring Point 1

Stormwater monitoring and discharge point, Outlet at Reddalls Road - Monitoring point labelled 1 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297777 N6183972

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	1	4	106	253	570

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Ammonia	milligrams per litre	1	4	1-08	11-28	41-7
Calcium	milligrams per litre	1	4	26	33-75	49
Chloride	milligrams per litre	1	4	33	100-5	189
Conductivity	milligrams per litre	1	4	391	853	1670
Dissolved Oxygen	milligrams per litre	1	4	8-28	8-73	9-08
Filterable iron	milligrams per litre	1	4	0-22	0-43	0-67
Fluoride	milligrams per litre	1	4	0-3	0-35	0-4
Magnesium	milligrams per litre	1	4	10	21-25	36
Nitrate	milligrams per litre	1	4	0-08	1-27	3-16
pH	pH	1	4	6-8	7-75	8-4
Potassium	milligrams per litre	1	4	6	25-75	50
Sodium	milligrams per litre	1	4	34	96-75	187
Sulfate	milligrams per litre	1	4	14	25	31
Temperature	degrees Celsius	1	4	15-3	17-93	22-4
Total organic carbon	milligrams per litre	1	4	12	30-75	71
Total Phenolics	milligrams per litre	1	4	<0-05	<0-05	<0-05

Total suspended solids	milligrams per litre	1	4	23	49	98

Monitoring Point 2 DESTROYED

Groundwater quality monitoring, Monitoring point labelled GABH01 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297751.8 N6184474

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre					
Aluminium	milligrams per litre					
Arsenic	milligrams per litre					
Barium	milligrams per litre					
Benzene	milligrams per litre					
Cadmium	milligrams per litre					
Calcium	milligrams per litre					
Chloride	milligrams per litre					
Chromium (hexavalent)	milligrams per litre					
Chromium (total)	milligrams per litre					
Cobalt	milligrams per litre					
Conductivity	millisiemens per centimetre					

Copper	milligrams per litre					
Ethyl benzene	micrograms per litre					
Fluoride	milligrams per litre					
Lead	milligrams per litre					
Magnesium	milligrams per litre					
Manganese	micrograms per litre					
Mercury	milligrams per litre					
Nitrate	milligrams per litre					
Nitrite	milligrams per litre					
Nitrogen (ammonia)	milligrams per litre					
Organochlorine pesticides	milligrams per litre					
Organophosphate pesticides	milligrams per litre					
pH	pH					
Polycyclic aromatic hydrocarbons	milligrams per litre					
Potassium	milligrams per litre					
Sodium	milligrams per litre					

Standing Water Level	metres					
Sulfate	milligrams per litre					
Toluene	milligrams per litre					
Total dissolved solids	milligrams per litre					
Total organic carbon	milligrams per litre					
Total petroleum hydrocarbons	milligrams per litre					
Total Phenolics	milligrams per litre					
Xylene	milligrams per litre					
Zinc	milligrams per kilogram					

DETECTED

Monitoring Point 3

Surface gas monitoring, Areas where intermediate or final cover has been placed.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 4

Gas accumulation monitoring, Inside all buildings within 250 metres of deposited waste.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	1	12	0.00014	0.00022	0.00019

Monitoring Point 5

Groundwater quality monitoring, Monitoring point labelled GABH02 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297754.9 N6184377

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	955	1000.75	1090
Aluminium	milligrams per litre	1	1	0.02	0.02	0.02
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.002	0.002	0.002
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	299	314.25	346
Chloride	milligrams per litre	4	4	1060	1112.5	1160
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	millisiemens per centimetre	4	4	5060	5297.5	5450

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Copper	milligrams per litre	1	1	<0·001	<0·001	<·001
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0·6	0·6	0·6
Lead	milligrams per litre	1	1	<0·001	<0·001	<0·001
Magnesium	milligrams per litre	4	4	194	199-75	209
Manganese	micrograms per litre	1	1	0·046	0·046	0·046
Mercury	milligrams per litre	1	1	·0·0001	·0·0001	-0·0001
Nitrate	milligrams per litre	1	1	0·01	0·01	0·01
Nitrite	milligrams per litre	1	1	<0·01	<0·01	<0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·01	0·02	0·03
Organochlorine pesticides	milligrams per litre	1	1	-0·5	-0·5	-0·5
Organophosphate pesticides	milligrams per litre	1	1	-0·5	-0·5	-0·5
pH	pH	4	4	6·6	21-45	66
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	-1	-1	-1
Potassium	milligrams per litre	4	4	3	3	3
Sodium	milligrams per litre	4	4	566	618·25	661

Standing Water Level	metres	4	4	4.72	4.885	5.02
Sulfate	milligrams per litre	4	4	160	170.5	187
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	2800	3170	3550
Total organic carbon	milligrams per litre	4	4	5	15.75	44
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	2	2	2
Zinc	milligrams per kilogram	1	1	<0.005	<0.005	<0.005

Monitoring Point 6

Groundwater quality monitoring, Monitoring point labelled GABH03 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297793.8 N6184315

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	658	685.5	738
Aluminium	milligrams per litre	1	1	<0.01	<0.01	<0.01
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.016	0.016	0.016

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	342	355.75	380
Chloride	milligrams per litre	4	4	1160	1215	1280
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.002	0.002	0.002
Conductivity	millisiemens per centimetre	4	4	4920	5307.5	5530
Copper	milligrams per litre	1	1	<0.001	<0.001	<0.001
Ethyl benzene	micrograms per litre	1	1	2	2	2
Fluoride	milligrams per litre	1	1	0.6	0.6	0.6
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	208	212.5	219
Manganese	micrograms per litre	1	1	.308	.308	.308
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.035	0.07
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.5	6.6	6.7
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1.0	<1.0	<1.0
Potassium	milligrams per litre	4	4	2	2	2
Sodium	milligrams per litre	4	4	464	511.75	554
Standing Water Level	metres	4	4	0.36	0.515	0.72
Sulfate	milligrams per litre	4	4	194	202.5	224
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	2910	3405	3890
Total organic carbon	milligrams per litre	4	4	4	12	35
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	<0.005	<0.005	<0.005

Monitoring Point 7

Groundwater quality monitoring, Monitoring point labelled GABH06D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297975.6 N6184322

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	318	332	364
Aluminium	milligrams per litre	1	1	0.04	0.04	0.04
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.008	0.008	0.008
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	111	119	127
Chloride	milligrams per litre	4	4	631	662.5	700
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	millisiemens per centimetre	4	4	3090	3145	3200

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Copper	milligrams per litre	1	1	<0.001	<0.001	<0.001
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.6	0.6	0.6
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	70	75.5	83
Manganese	micrograms per litre	1	1	0.004	0.004	0.004
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0125	0.02
Organochlorine pesticides	milligrams per litre	1	1	<0.05	<0.05	<0.05
Organophosphate pesticides	milligrams per litre	1	1	<0.05	<0.05	<0.05
pH	pH	4	4	6.7	6.85	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	402	438.75	460

Standing Water Level	metres	4	4	1.64	1.86	2.02
Sulfate	milligrams per litre	4	4	194	201.75	209
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1600	1720	1900
Total organic carbon	milligrams per litre	4	4	1	5.5	18
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	<0.005	<0.005	<0.005

Monitoring Point 8

Groundwater quality monitoring, Monitoring point labelled GABH06S on Figure 15 titled "Current Site Investigation Locations" dated 8 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297977 N6184322

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	396	401.75	408
Aluminium	milligrams per litre	1	1	0.08	0.08	0.08
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.117	0.117	0.117

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	78	90.25	97
Chloride	milligrams per litre	4	4	579	619.5	658
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	millisiemens per centimetre	4	4	2810	3030	3120
Copper	milligrams per litre	1	1	0.002	0.002	0.002
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	1.2	1.2	1.2
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	72	83.5	94
Manganese	micrograms per litre	1	1	0.059	0.059	0.059
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

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Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0275	0.06
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	7	7.075	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	<1	<1	<1
Sodium	milligrams per litre	4	4	392	463	494
Standing Water Level	metres	4	4	2.18	2.33	2.5
Sulfate	milligrams per litre	4	4	204	212.5	217
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1420	1692.5	1800
Total organic carbon	milligrams per litre	4	4	1	5.5	17
Total petroleum hydrocarbons	milligrams per litre	1	1	<1.2	<1.2	<1.2
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	<0.005	<0.005	<0.005

Monitoring Point 9

Groundwater quality monitoring, Monitoring point labelled GMW102 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297952.6 N6184807

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	243	257	271
Aluminium	milligrams per litre	1	1	7.77	7.77	7.77
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.055	0.055	0.055
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	0.0004	0.0004	0.0004
Calcium	milligrams per litre	4	4	50	53	56
Chloride	milligrams per litre	4	4	24	26.5	29
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.003	0.003	0.003
Cobalt	milligrams per litre	1	1	0.004	0.004	0.004
Conductivity	millisiemens per centimetre	4	4	594	607.5	621

Copper	milligrams per litre	1	1	0·023	0·023	0·023
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0·7	0·7	0·7
Lead	milligrams per litre	1	1	0·005	0·005	0·005
Magnesium	milligrams per litre	4	4	17	19·5	22
Manganese	micrograms per litre	1	1	0·227	0·227	0·227
Mercury	milligrams per litre	1	1	<0·0001	<0·0001	<0·0001
Nitrate	milligrams per litre	1	1	0·26	0·26	0·26
Nitrite	milligrams per litre	1	1	<0·01	<0·01	<0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·01	0·015	0·02
Organochlorine pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
Organophosphate pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
pH	pH	4	4	7·3	7·3	7·3
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1·5	2·0
Sodium	milligrams per litre	4	4	47	52·5	58

Standing Water Level	metres	4	4	9.55	10.06	10.57
Sulfate	milligrams per litre	4	4	22	26.5	31
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	350	380.5	411
Total organic carbon	milligrams per litre	4	4	4	4.5	5.0
Total petroleum hydrocarbons	milligrams per litre	1	1	50	50	50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0.049	0.049	0.049

Monitoring Point 10

Groundwater quality monitoring, Monitoring point labelled GMW103 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470.2 N6184603

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	265	357.5	436
Aluminium	milligrams per litre	1	1	0.1	0.1	0.1
Arsenic	milligrams per litre	1	1	<.001	<0.001	<0.001
Barium	milligrams per litre	1	1	.023	.023	.023

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WOLLONGONG CITY COUNCIL

NSW EPA

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<.0001	<.0001	<.0001
Calcium	milligrams per litre	4	4	196	204.75	216
Chloride	milligrams per litre	4	4	486	496.75	524
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.012	0.012	0.012
Cobalt	milligrams per litre	1	1	<.004	<0.004	<0.004
Conductivity	millisiemens per centimetre	4	4	2380	2430	2490
Copper	milligrams per litre	1	1	0.004	0.004	0.004
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.6	0.6	0.6
Lead	milligrams per litre	1	1	<.001	<.001	<.001
Magnesium	milligrams per litre	4	4	70	73	77
Manganese	micrograms per litre	1	1	0.107	0.107	0.107
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01

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Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.08	0.27
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.8	6.85	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	159	177.5	192
Standing Water Level	metres	4	4	7.57	7.68	7.78
Sulfate	milligrams per litre	4	4	131	139	149
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1320	1512.5	1710
Total organic carbon	milligrams per litre	4	4	1	6.5	21
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.007	0.007	0.007

Monitoring Point 11

Groundwater quality monitoring, Monitoring point labelled GMW104 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297597.9 N6184508

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	238	343	410
Aluminium	milligrams per litre	1	1	0.1	0.1	0.1
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.014	0.014	0.014
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	44	49.5	60
Chloride	milligrams per litre	4	4	54	73.25	91
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	<0.002	<0.002	<0.002
Conductivity	millisiemens per centimetre	4	4	513	972	1240

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NSW EPA

Copper	milligrams per litre	1	1	0.006	0.006	0.006
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.8	0.8	0.8
Lead	milligrams per litre	1	1	<0.002	<0.002	<0.002
Magnesium	milligrams per litre	4	4	24	29	34
Manganese	micrograms per litre	1	1	0.189	0.189	0.189
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.062	0.17
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.6	7.08	7.3
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	99	126.5	164

Standing Water Level	metres	4	4	6.88	7.23	7.54
Sulfate	milligrams per litre	4	4	36	47.25	56
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	357	513	674
Total organic carbon	milligrams per litre	4	4	2	7.5	20
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0.011	0.011	0.011

Monitoring Point 12

Groundwater quality monitoring, Monitoring point labelled GMW105 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298433.3 N6184397

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	44	47.25	51
Aluminium	milligrams per litre	1	1	10.3	10.3	10.3
Arsenic	milligrams per litre	1	1	0.001	0.001	0.001
Barium	milligrams per litre	1	1	0.056	0.056	0.056

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NSW EPA

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	4	5.75	9
Chloride	milligrams per litre	4	4	32	36.25	41
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.008	0.008	0.008
Cobalt	milligrams per litre	1	1	0.004	0.004	0.004
Conductivity	millisiemens per centimetre	4	4	250	1682.75	5970
Copper	milligrams per litre	1	1	0.033	0.033	0.033
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.2	0.2	0.2
Lead	milligrams per litre	1	1	0.007	0.007	0.007
Magnesium	milligrams per litre	4	4	2	3	5
Manganese	micrograms per litre	1	1	0.206	0.206	0.206
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01

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Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	1	1	0.01	0.018	0.03
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	5.3	5.68	6
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1.25	2
Sodium	milligrams per litre	4	4	34	38	42
Standing Water Level	metres	4	4	10.54	10.74	11.06
Sulfate	milligrams per litre	4	4	12	13	14
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	125	168.75	197
Total organic carbon	milligrams per litre	4	4	1	5	11
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.043	0.043	0.043

Monitoring Point 13

Groundwater quality monitoring, Monitoring point labelled GMW106 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298356.8 N6184294

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre					
Aluminium	milligrams per litre					
Arsenic	milligrams per litre					
Barium	milligrams per litre		DESTROYED			
Benzene	milligrams per litre					
Cadmium	milligrams per litre					
Calcium	milligrams per litre					
Chloride	milligrams per litre					
Chromium (hexavalent)	milligrams per litre					
Chromium (total)	milligrams per litre					
Cobalt	milligrams per litre					
Conductivity	millisiemens per centimetre					

Copper	milligrams per litre					
Ethyl benzene	micrograms per litre					
Fluoride	milligrams per litre					
Lead	milligrams per litre					
Magnesium	milligrams per litre					
Manganese	micrograms per litre					
Mercury	milligrams per litre					
Nitrate	milligrams per litre		DESTROYED			
Nitrite	milligrams per litre					
Nitrogen (ammonia)	milligrams per litre					
Organochlorine pesticides	milligrams per litre					
Organophosphate pesticides	milligrams per litre					
pH	pH					
Polycyclic aromatic hydrocarbons	milligrams per litre					
Potassium	milligrams per litre					
Sodium	milligrams per litre					

Standing Water Level	metres					
Sulfate	milligrams per litre					
Toluene	milligrams per litre					
Total dissolved solids	milligrams per litre					
Total organic carbon	milligrams per litre		DESTROYED			
Total petroleum hydrocarbons	milligrams per litre					
Total Phenolics	milligrams per litre					
Xylene	milligrams per litre					
Zinc	milligrams per kilogram					

Monitoring Point 14

Groundwater quality monitoring, Monitoring point labelled GMW108S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297870.2 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	319	374.5	494
Aluminium	milligrams per litre	1	1	4.63	4.63	4.63
Arsenic	milligrams per litre	1	1	0.002	0.002	0.002
Barium	milligrams per litre	1	1	0.117	0.117	0.117

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Benzene	milligrams per litre	1	1	1	1	1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	16	36	84
Chloride	milligrams per litre	4	4	123	237.75	424
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.004	0.004	0.004
Cobalt	milligrams per litre	1	1	0.009	0.009	0.009
Conductivity	millisiemens per centimetre	4	4	1030	1897.5	3460
Copper	milligrams per litre	1	1	0.008	0.008	0.008
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.6	0.6	0.6
Lead	milligrams per litre	1	1	0.004	0.004	0.004
Magnesium	milligrams per litre	4	4	13	28.25	64
Manganese	micrograms per litre	1	1	0.354	0.354	0.354
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

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Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.035	0.06
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.8	6.85	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1.5	2.0
Sodium	milligrams per litre	4	4	198	257.75	295
Standing Water Level	metres	4	4	2.64	2.71	2.84
Sulfate	milligrams per litre	4	4	40	69.25	127
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	650	820.25	1150
Total organic carbon	milligrams per litre	4	4	7	10.5	15
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<1	<1	<1

Zinc	milligrams per kilogram	1	1	0.017	0.017	0.017

Monitoring Point 15

Groundwater quality monitoring, Monitoring point labelled GMW108D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297871.4 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	446	467.25	509
Aluminium	milligrams per litre	1	1	0.08	0.08	0.08
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.016	0.016	0.016
Benzene	milligrams per litre	1	1	1	1	1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	124	131	141
Chloride	milligrams per litre	4	4	613	638	659
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	millisiemens per centimetre	4	4	3140	3235	3330

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Copper	milligrams per litre	1	1	0.004	0.004	0.004
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.8	0.8	0.8
Lead	milligrams per litre	1	1	0.001	0.001	0.001
Magnesium	milligrams per litre	4	4	91	93.25	98
Manganese	micrograms per litre	1	1	0.008	0.008	0.008
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.0475	0.15
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.8	6.83	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	<1	1	1
Sodium	milligrams per litre	4	4	392	439.5	474

Standing Water Level	metres	4	4	2.14	2.1845	2.238
Sulfate	milligrams per litre	4	4	185	197.25	215
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1560	1705	1830
Total organic carbon	milligrams per litre	4	4	1	7.25	23
Total petroleum hydrocarbons	milligrams per litre	1	1	<50	<50	<50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0.009	0.009	0.009

Monitoring Point 16

Groundwater quality monitoring, Monitoring point labelled GMW109S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297605.7 N6184068

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	412	771.75	980
Aluminium	milligrams per litre	1	1	0.67	0.67	0.67
Arsenic	milligrams per litre	1	1	0.005	0.005	0.005
Barium	milligrams per litre	1	1	0.46	0.46	0.46

Benzene	milligrams per litre	1	1	1	1	1
Cadmium	milligrams per litre	1	1	0.0002	0.0002	0.0002
Calcium	milligrams per litre	4	4	133	226.25	309
Chloride	milligrams per litre	4	4	163	183.25	225
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.002	0.002	0.002
Cobalt	milligrams per litre	1	1	0.004	0.004	0.004
Conductivity	millisiemens per centimetre	4	4	1590	2102.5	2400
Copper	milligrams per litre	1	1	0.006	0.006	0.006
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	42	55.75	65
Manganese	micrograms per litre	1	1	3.46	3.46	3.46
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01

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Nitrite	milligrams per litre	1	1	<0.04	<0.04	<0.04
Nitrogen (ammonia)	milligrams per litre	4	4	3.27	6.93	7.76
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.4	6.88	7.1
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	7	11.75	16
Sodium	milligrams per litre	4	4	161	171	183
Standing Water Level	metres	4	4	3.32	3.43	3.62
Sulfate	milligrams per litre	4	4	82	137	190
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	880	1240	1460
Total organic carbon	milligrams per litre	4	4	14	45.5	80
Total petroleum hydrocarbons	milligrams per litre	1	1	350	350	350
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.087	0.087	0.087

Monitoring Point 17

Groundwater quality monitoring, Monitoring point labelled GMW110 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297572.6 N6184266

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	547	572	623
Aluminium	milligrams per litre	1	1	0.55	0.55	0.55
Arsenic	milligrams per litre	1	1	<.001	<.001	<.001
Barium	milligrams per litre	1	1	0.006	0.006	0.006
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	178	193.75	214
Chloride	milligrams per litre	4	4	787	818.25	848
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	millisiemens per centimetre	4	4	3870	3977.5	4060

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Copper	milligrams per litre	1	1	0.002	0.002	0.002
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	151	154.25	160
Manganese	micrograms per litre	1	1	0.044	0.044	0.044
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.05	0.05	0.05
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.025	0.05
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	-0.5	-0.5	-0.5
pH	pH	4	4	6.6	6.73	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	2	2	2
Sodium	milligrams per litre	4	4	435	463.25	500

Standing Water Level	metres	4	4	4.02	4.12	4.23
Sulfate	milligrams per litre	4	4	279	291.5	319
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	2130	2375	2590
Total organic carbon	milligrams per litre	4	4	2	8.75	28
Total petroleum hydrocarbons	milligrams per litre	1	1	.50	.50	.50
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
Xylene	milligrams per litre	1	1	2	2	2
Zinc	milligrams per kilogram	1	1	0.007	0.007	0.007

Monitoring Point 18

Groundwater quality monitoring, Monitoring point labelled GMW111 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297588.6 N6184385

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	435	449	483
Aluminium	milligrams per litre	1	1	0.69	0.69	0.69
Arsenic	milligrams per litre	1	1	0.001	0.001	0.001
Barium	milligrams per litre	1	1	0.033	0.037	0.037

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Benzene	milligrams per litre	1	1	1	1	1
Cadmium	milligrams per litre	1	1	.0002	.0002	.0002
Calcium	milligrams per litre	4	4	78	90.75	104
Chloride	milligrams per litre	4	4	112	395.75	504
Chromium (hexavalent)	milligrams per litre	1	1	0.01	0.01	0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	millisiemens per centimetre	4	4	2410	2532.5	2640
Copper	milligrams per litre	1	1	0.007	0.007	0.007
Ethyl benzene	micrograms per litre	1	1	2	2	2
Fluoride	milligrams per litre	1	1	0.6	0.6	0.6
Lead	milligrams per litre	1	1	.003	.003	.003
Magnesium	milligrams per litre	4	4	73	75	79
Manganese	micrograms per litre	1	1	0.229	0.229	0.229
Mercury	milligrams per litre	1	.1	0.0001	0.0001	0.0001
Nitrate	milligrams per litre	1	1	0.03	0.03	0.03

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Nitrite	milligrams per litre	1	1	0.01	0.01	0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.023	0.04
Organochlorine pesticides	milligrams per litre	1	1	0.5	0.5	0.5
Organophosphate pesticides	milligrams per litre	1	1	0.5	0.5	0.5
pH	pH	4	4	6.9	7.03	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	1	1	1
Potassium	milligrams per litre	4	4	1	1.25	2
Sodium	milligrams per litre	4	4	326	361.5	397
Standing Water Level	metres	4	4	6.11	6.29	6.43
Sulfate	milligrams per litre	4	4	106	113.5	123
Toluene	milligrams per litre	1	1	2	2	2
Total dissolved solids	milligrams per litre	4	4	1270	1332.5	1380
Total organic carbon	milligrams per litre	4	4	1	6	19
Total petroleum hydrocarbons	milligrams per litre	1	1	50	50	50
Total Phenolics	milligrams per litre	1	1	0.05	0.05	0.05
Xylene	milligrams per litre	1	1	2	2	2

Zinc	milligrams per kilogram	1	1	0.024	0.024	0.024

Monitoring Point 19

Groundwater quality monitoring, Monitoring point labelled GMW109D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297604.9 N6184068

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	222	229.5	249
Aluminium	milligrams per litre	1	1	0.08	0.08	0.08
Arsenic	milligrams per litre	1	1	0.001	0.001	0.001
Barium	milligrams per litre	1	1	0.126	0.126	0.126
Benzene	milligrams per litre	1	1	1	1	1
Cadmium	milligrams per litre	1	1	0.0001	0.0001	0.0001
Calcium	milligrams per litre	4	4	78	84	90
Chloride	milligrams per litre	4	4	363	370.75	382
Chromium (hexavalent)	milligrams per litre	1	1	0.01	0.01	0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	millisiemens per centimetre	4	4	1600	1657.5	1700

Copper	milligrams per litre	1	1	0·006	0·006	0·006
Ethyl benzene	micrograms per litre	1	1	2	2	2
Fluoride	milligrams per litre	1	1	0·4	0·4	0·4
Lead	milligrams per litre	1	1	0·001	0·001	0·001
Magnesium	milligrams per litre	4	4	44	45·25	47
Manganese	micrograms per litre	1	1	0·035	0·035	0·035
Mercury	milligrams per litre	1	1	0·0001	0·0001	0·0001
Nitrate	milligrams per litre	1	1	0·16	0·16	0·16
Nitrite	milligrams per litre	1	1	0·01	0·01	0·01
Nitrogen (ammonia)	milligrams per litre	1	1	0·01	0·048	0·14
Organochlorine pesticides	milligrams per litre	1	1	0·5	0·5	0·5
Organophosphate pesticides	milligrams per litre	1	1	0·5	0·5	0·5
pH	pH	4	4	7·2	7·35	7·5
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	1	1	1
Potassium	milligrams per litre	4	4	2	2	2
Sodium	milligrams per litre	4	4	174	189·25	201

Standing Water Level	metres	4	4	2-86	3.04	3.23
Sulfate	milligrams per litre	4	4	24	25.5	28
Toluene	milligrams per litre	1	1	2	2	2
Total dissolved solids	milligrams per litre	4	4	769	930.25	1060
Total organic carbon	milligrams per litre	4	4	1	3	9
Total petroleum hydrocarbons	milligrams per litre	1	1	30	50	30
Total Phenolics	milligrams per litre	1	1	0.05	0.05	0.05
Xylene	milligrams per litre	1	1	1	1	1
Zinc	milligrams per kilogram	1	1	0.012	0.012	0.012

Monitoring Point 20

Groundwater quality monitoring, Monitoring point labelled BH6 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297807.4 N6184052

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	711	741	816
Aluminium	milligrams per litre	1	1	0.05	0.05	0.05
Arsenic	milligrams per litre	1	1	0.003	0.003	0.003
Barium	milligrams per litre	1	1	0.055	0.055	0.055

Benzene	milligrams per litre	1	1	1	1	1
Cadmium	milligrams per litre	1	1	0.0001	0.0001	0.0001
Calcium	milligrams per litre	4	4	120	124.5	134
Chloride	milligrams per litre	4	4	954	1022	1120
Chromium (hexavalent)	milligrams per litre	1	1	0.01	0.01	0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	0.01	0.01	0.01
Conductivity	millisiemens per centimetre	4	4	4720	4972.5	5170
Copper	milligrams per litre	1	1	0.008	0.008	0.008
Ethyl benzene	micrograms per litre	1	1	2	2	2
Fluoride	milligrams per litre	1	1	1.1	1.1	1.1
Lead	milligrams per litre	1	1	0.005	0.005	0.005
Magnesium	milligrams per litre	4	4	129	133	137
Manganese	micrograms per litre	1	1	1.77	1.77	1.77
Mercury	milligrams per litre	1	1	.0001	.0001	.0001
Nitrate	milligrams per litre	1	1	.01	.01	.01

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Nitrite	milligrams per litre	1	1	.01	.01	.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.07	0.09	0.12
Organochlorine pesticides	milligrams per litre	1	1	0.5	0.5	0.5
Organophosphate pesticides	milligrams per litre	1	1	0.5	0.5	0.5
pH	pH	4	4	6.7	6.8	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	1	1	1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	760	819.25	882
Standing Water Level	metres	4	4	1.46	1.511	1.64
Sulfate	milligrams per litre	4	4	283	289	302
Toluene	milligrams per litre	1	1	2	2	2
Total dissolved solids	milligrams per litre	4	4	2500	2750	2930
Total organic carbon	milligrams per litre	4	4	2	6	17
Total petroleum hydrocarbons	milligrams per litre	1	1	50	50	50
Total Phenolics	milligrams per litre	1	1	.05	.05	.05
Xylene	milligrams per litre	1	1	2	2	2

Zinc	milligrams per kilogram	1	1	0.010	0.010	0.010

Monitoring Point 21

Subsurface gas monitoring, Monitoring point labelled LFG MW1 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298084 N6184278

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 22

Subsurface gas monitoring, Monitoring point labelled LFG MW2 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298202 N6184228

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 23

Subsurface gas monitoring, Monitoring point labelled LFG MW3 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298297 N6184244

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 24

Subsurface gas monitoring, Monitoring point labelled LFG MW4 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 25

Subsurface gas monitoring, Monitoring point labelled LFG MW5 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298438 N6184381

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 26

Subsurface gas monitoring, Monitoring point labelled LFG MW6 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 27

Subsurface gas monitoring, Monitoring point labelled LFG MW7 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470 N6184553

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 28

Subsurface gas monitoring, Monitoring point labelled LFG MW8 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 29

Subsurface gas monitoring, Monitoring point labelled LFG MW9 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298465 N6184645

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 30

Subsurface gas monitoring, Monitoring point labelled LFG MW10 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298448 N6184684

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 31

Subsurface gas monitoring, Monitoring point labelled LFG MW11 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298400 N6184695

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 32

Subsurface gas monitoring, Monitoring point labelled LFG MW12 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298351 N6184701

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	1	12	0	0.00098	0.07013

Monitoring Point 33

Stormwater monitoring point, Downstream monitoring point labelled 4 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297767 N6183396

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	0	*			
Ammonia	milligrams per litre	0				
Calcium	milligrams per litre	0				
Chloride	milligrams per litre	0				
Conductivity	milligrams per litre	0				
Dissolved Oxygen	milligrams per litre	0				
Filterable iron	milligrams per litre	0				

* This requirement was added to EPA licence version date 23 August 2013
Annual Sampling completed prior to this requirem

Fluoride	milligrams per litre	0				
Magnesium	milligrams per litre	0				
Nitrate	milligrams per litre	0				
pH	pH	0				
Potassium	milligrams per litre	0				
Sodium	milligrams per litre	0				
Sulfate	milligrams per litre	0				
Temperature	degrees Celsius	0				
Total organic carbon	milligrams per litre	0				
Total Phenolics	milligrams per litre	0				
Total suspended solids	milligrams per litre	0				

Monitoring Point 34

Stormwater monitoring point, Upstream monitoring point labelled 6 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297495 N6184504

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	0	*			
Ammonia	milligrams per litre	0				

* This requirement was added to EPA Licence version date 23 August 2013
Annual sampling completed prior to this requirement

Calcium	milligrams per litre	0				
Chloride	milligrams per litre	0				
Conductivity	milligrams per litre	0				
Dissolved Oxygen	milligrams per litre	0				
Filterable iron	milligrams per litre	0				
Fluoride	milligrams per litre	0				
Magnesium	milligrams per litre	0				
Nitrate	milligrams per litre	0				
pH	pH	0				
Potassium	milligrams per litre	0				
Sodium	milligrams per litre	0				
Sulfate	milligrams per litre	0				
Temperature	degrees Celsius	0				
Total organic carbon	milligrams per litre	0				
Total Phenolics	milligrams per litre	0				
Total suspended solids	milligrams per litre	0				

B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables provided below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

PLEASE FIND UPDATED STATEMENT OF COMPLIANCE CONDITIONS (BELOW) MARCH 2016

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C Statement of Compliance - Licence Conditions

C1 Compliance with Licence Conditions

(☑ the boxes)

1 Were all conditions of the licence complied with (including monitoring and reporting requirements)? ☐ Yes ☒ No

(✓ a box)

2 If you answered 'No' to question 1, please supply the following details for each non -compliance in the format, or similar format , provided on the following page.

Please use a separate page for each licence condition that has not been complied with.

a) What was the specific licence condition that was not complied with?

b) What were the particulars of the non -compliance?

c) What were the date(s) when the non -compliance occurred, if applicable?

d) If relevant, what was the precise location where the non -compliance occurred?

Attach a map or diagram to the Statement to show the precise location.

e) What were the registrati on numbers of any vehicles or the chassis number of any mobile plant involved in the non -compliance?

f) What was the cause of the non -compliance?

g) What action has been, or will be, taken to mitigate any adverse effects of the non -compliance?

h) What action has been, or will be, taken to prevent a recurrence of the non -compliance?

3. How many pages have you attached?

Each attached page must be initialled by the person(s) who signs Section G of this Annual Return

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C2 Details of Non-Compliance with Licence

Licence condition number not complied with
EPL 5862 - condition 06.4
Summary of particulars of the non-compliance **(NO MORE THAN 50 WORDS)**
Exhumation of landfilled waste at the Wollongong Waste & Resource Recovery Park (Whytes Gully) without written approval from the EPA.
If required, further details on particulars of non-compliance
Council operative excavated into previously landfilled waste to dispose of bulky materials.
Date(s) when the non-compliance occurred, if applicable
5 May 2014
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
AE79SP
Cause of non-compliance
Creating offensive odour
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
To help ensure a similar licence breach does not take place in the future a Safe Operating Procedure has been developed for the Placement and handling of Special Waste Materials
Action taken or that will be taken to prevent a recurrence of the non-compliance
Staff inducted and trained in the Safe Operating Procedure 'Placement and Handling of Special Waste Materials

D Statement of Compliance - Load-Based Fee Calculation Worksheets

If you are not required to monitor assessable pollutants by your licence, no worksheets will appear below. Please go to Section E.

If assessable pollutants have been identified on your licence (see licence condition L2), complete the following worksheets for each assessable pollutant to determine your load-based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in the EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been sent to you with your licence. If you require additional copies you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

D1 - D8 (Not Applicable)

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E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Is the PIRMP available at the premises?

(✓ a box) ☑ Yes ☐ No

3 Is the PIRMP available in a prominent position on a publicly accessible web site?

(✓ a box) ☐ Yes ☐ No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address: http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx

4 Has the PIRMP been tested?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on: 31 JULY 2013

5 Has the PIRMP been updated?

(✓ a box) ☐ Yes ☐ No

If you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on: 1 JULY 2014

6 How many times has the PIRMP been activated in this reporting period? 0

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated:

The PIRMP was activated on: N/A

The EPA's guidelines for preparation of pollution incident response management plans are available at

http://www.epa.nsw.gov.au/legislation/20120227egpreppirmp.htm

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(✓ a box) ☑ Yes ☐ No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(✓ a box) ☑ Yes ☐ No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address www.wollongong.nsw.gov.au/services/household/pages/wastesiteanalyticalmonitoringdata.aspx

The EPA's written requirements for publishing pollution monitoring data are available at http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm

Note - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data.

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

G Signature and Certification

This Annual Return may only be signed by a person(s) with legal authority to sign it as set out in the categories below. **Please tick (✓) the box** next to the category that describes how this Annual Return is being signed.

If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700.

If the licence holder is:		the Annual Return must be signed and certified:
an individual	☐	by the individual licence holder, or
	☐	by a person approved in writing by the EPA to sign on the licence holder's behalf
a company	☐	by affixing the common seal in accordance with Corporations Act 2001, or
	☐	by 2 directors, or
	☐	by a director and a company secretary, or
	☐	if a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	☐	by a person delegated to sign on the company's behalf in accordance with the Corporations Act 2001 and approved in writing by the EPA to sign on the company's behalf.
a public authority (other than a council)	☐	by the Chief Executive Officer of the public authority, or
	☐	by a person delegated to sign on the public authority's behalf in accordance with its legislation and approved in writing by the EPA to sign on the public authority's behalf.
a local council	☐	by the General Manager in accordance with s.377 of the Local Government Act 1993, or
	☐	by affixing the seal of the council in a manner authorised under that Act

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of $250,000 for a corporation or $120,000 for an individual.

I/We

- *declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and*
- *certify that the information in the Statement of Compliance in sections A, C, D, E and F and any pages attached to Section C is correct and not false or misleading in a material respect.*

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates below and specify the new dates to which this Annual Return relates below:

For the reporting period 29-May-2013 to 28-May-2014 or ___/___/___ to ___/___/___

SIGNATURE: _____ SIGNATURE: _____

NAME: (printed) W. PETERSON NAME: (printed) _____

POSITION: WASTE SERVICES POSITION: _____

DATE: 26 / 07 / 2014 DATE: ___/___/___

SEAL(if signing under seal)

PLEASE ENSURE THAT ALL APPROPRIATE BOXES HAVE BEEN COMPLETED AND THAT THE CHECKLIST ON PAGE 2 OF THE ANNUAL RETURN HAS BEEN COMPLETED

Whytes Gully Waste Disposal Facility

(Wollongong Waste And Resource Recovery Park)

Environment Protection Licence 5862

Annual Report

Period 29 May 2014 – 28 May 2015

Reference Z15/150361

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ABBREVIATIONS

Al	Aluminium
ANZECC	Australian and New Zealand Environment Conservation Council
Ar	Arsenic
Ba	Barium
Ca	Calcium
$CaCO_3$	Calcium Carbonate
Cd	Cadmium
CH_4	Methane
Cl	Chloride
Co	Cobalt
Cr	Chromium
Cu	Copper
DC	Development Consent
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
F	Fluoride
K	Potassium
LEMP	Landfill Environmental Management Plan
Mg	Magnesium
Mn	Manganese
Na	Sodium
NH_3	Ammonia
NO_3	Nitrate
NO_2	Nitrite
ppm	Parts per Million
SO_4	Sulfate
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
WWARRP	Wollongong Waste And Resource Recovery Park
Zn	Zinc

1 INTRODUCTION

1.1 BACKGROUND

The City of Wollongong is located 80 kilometres south of Sydney and is Australia's 9th largest city. The Wollongong City Council (Council) governance area occupies a relatively narrow coastal strip bordered by the Royal National Park to the north, the Windang Bridge and Yallah to the south, the Tasman Sea to the east and the escarpment to the west.

Council owns and operates the Wollongong Waste and Resource Recovery Park (the Site), which is located on Reddalls Road at Kembla Grange. The Site is situated south west of Wollongong's central business district on approximately 50 hectares and is comprised of Lots 50, 52 and 53 of DP 1022266 and Lot 2 of DP 240557.

Council holds an Environmental Protection Licence (EPL) number 5862, for "Waste Disposal – Application to Land" for the Site. Council currently operates in accordance with the sites Landfill Environmental Management Plan (LEMP) and in accord with the requirements of the Sites EPL and Development Consent (DC).

1.2 OBJECTIVES OF THE ANNUAL REPORT

Condition R1.8 of the EPL specifies that Council must provide an Annual Report to accompany the Annual Return for the Site. The objective of this report is to provide that review.

1.3 SITE HISTORY

Whytes Gully was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. Initially, the 'western gully' section was landfilled. The western gully is unlined by modern standards and was used from 1982 to 1993. Initially coal wash refuse was used to provide daily cover, then around 1988/89 steel furnace slag was introduced because of its stability in wet weather and Council's inability to source local clean fill in sufficient quantities. The leachate collection from the western gully is through a series of rock drains at the centre of each lift. The rock drains connect with a riser and the leachate flows from riser to riser, and then to the leachate collection well at the base of the western gully. The western gully section of the landfill has been capped with clay to varying depths between 1m and 4m.

The 'eastern gully' section development received consent in 1992/93, following extensive public consultation. The eastern gully section is lined with a single layer of HDPE smooth liner, over a subsoil drainage layer of 5mm gravel and a corrugated groundwater drainage system. The eastern gully was excavated to rock and was developed in two stages, beginning with the first stage 80 to 100m above the slope from the current toe of the landfill embankment. The leachate is drained from the first stage of the eastern gully via a 300mm corrugated drainage pipe at the base and a 300mm thick sand layer above the liner.

The second stage of the eastern gully operates in front and above the first stage, with extended leachate drains and HDPE liner. The eastern gully has intermediate cover of varying quality on the embankments.

The new third stage of the eastern gully commenced construction in August 2013 and was completed in 2014. Waste commenced being placed in Cell 1a in March 2015. Council is currently awaiting approval from the Environment Protection Authority to place waste in Cell 1b.

Leachate is collected from all landfilled areas at the site and treated in a 3 stage process. The leachate is initially collected in a primary holding pond that uses a biological process and aeration primarily to strip the leachate of ammonia. The leachate is then pumped to a smaller pond with a greater surface area to increase the speed of this process. From the smaller pond the leachate is then pumped to a sequence batch reactor that in conjunction with a filtration system eliminates the residual contaminants in the leachate suitable for acceptance by sewer under the sites Trade Wastewater Agreement with Sydney Water.

1.4 RELEVANT DOCUMENTS

This annual report refers to and / or draws upon information and data from the following documents;

- Whytes Gully Waste Disposal Facility – Annual Return for Period 29 May 2013 to 28 May 2014. By Wollongong City Council July 2014
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2012 to 31 May 2013. By Wollongong City Council July 2013
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2011 to 31 May 2012. By Wollongong City Council July 2012
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2010 to 31 May 2011. By Wollongong City Council July 2011.
- Whytes Gully Waste Disposal Facility – Annual Report for Period 01 June 2009 to 31 May 2010. By GHD July 2010.

2 KEY LICENCE ISSUES

2.1 ENVIRONMENTAL PROTECTION LICENCE ANNUAL RETURNS

The Environment Protection Authority (EPA) has issued an *Environmental Protection Licence* (Licence No. 5862) for the landfill and related operations on the Whytes Gully site. The licence, issued under the *Protection of the Environment Operations Act 1997,* requires an annual return and report to be submitted to the EPA, detailing;

a) Statement of compliance; and

b) Monitoring and complaints summary.

c) Tabulated results of all monitoring data required by the licence from at least the last three years (if available).

d) A graphical presentation of the data for at least three years (if available).

e) Notations made regarding any statistically significant variations or anomalies.

f) An analysis and interpretation of all monitoring data.

g) An analysis of and response to any complaints received.

h) Identification of any deficiencies in environmental performance and remedial action taken or proposed to be taken.

i) Recommendations on improving the sites environmental performance.

The EPL Annual Returns for 2008 to 2014 reporting periods were reviewed to provide a background to this report. These Annual Returns can be summarised as follows:

01 June 2008 to 31 May 2009

B1. Pollution complaints - Nine
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Ten non compliances.
C2. Details of non-compliance

1. *Stormwater pH measurement > 8.5*
2. *Four missed stormwater conductivity measurements*
3. *Stormwater suspended solids > 50mg/L twice*
4. *Four missed potassium groundwater measurements*
5. *One missed groundwater redox, coliforms and dissolved oxygen measurements*
6. *Three missed groundwater alkalinity measurements*
7. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium tests*
8. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*

9. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*
10. *One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test*

01 June 2009 to 31 May 2010

B1. Pollution complaints - Twelve
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Five non compliances.
C2. Details of non-compliance

1. *Two missed stormwater temperature measurements*
2. *Missed stormwater filterable iron measurement*
3. *One round of groundwater monitoring missed*
4. *One round of groundwater monitoring missed*
5. *One round of landfill gas monitoring missed*

01 June 2010 to 31 May 2011

B1. Pollution complaints – Twelve
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non-compliance.
C2. Details of non-compliance – N/A

01 June 2011 to 31 May 2012

B1. Pollution complaints – Forty Eight
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non-compliance.
C2. Details of non-compliance – N/A

01 June 2012 to 31 May 2013

B1. Pollution complaints – Fifty nine
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non-compliance.
C2. Details of non-compliance – N/A

29 May 2013 to 28 May 2014

B1. Pollution complaints – forty eight
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non-compliance.
C2. Details of non-compliance – ~~*N/A*~~ *One (1) Penalty received against licence condition O6.4 – Report corrected 8/4/2016.*

In summary, compliance issues have generally been restricted to minor exceedances of pH and suspended solids in the sediment pond, and these issues are covered by ongoing monitoring provisions.

A potential problem existed prior to June 2010 with seemingly regular missed analytical testing regimes over the previous two years. Subsequently, Council formally tendered for the environmental testing at the site, which now ensures regular testing routines are in place under contract performance requirements.

The EPL has had several variations applied to it in recent years. These changes include:

- Approval granted to dispose of waste in Cell 1A on 28 October 2014.
- Site boundaries updated to excise the previous Solid Waste to Energy Recovery Facility from the landfill licence to allow Visy to gain their own licence for the retrofit of the building as a Materials Recovery Facility. Also addition of a Potential Offensive Odour clause and analytical unit measures amended on 08 July 2014.
- Wording amendments and consolidation of various clauses as well as monitoring point updates in 23 August 2013.
- Inclusion of further enhanced and upgraded environment sampling points on 23 August 2013 for the Stage 3 (new landfill cell development).
- Overhauled and reformatted licence resulting from Council's request to modernise environmental testing requirements and to formally recognise the increased environmental sampling points and standards adopted by Council for the site. The request formed Annexure B of the 2010/2011 Annual Environmental Management Report and was formally approved and adopted by the EPA on 16 April 2012.
- Tidy up of various incremental site changes including lot and boundary amendments, sampling point review and update including location detail, removal of redundant trial and reporting details and various other updates in line with EPA reformatting and internal software and consistency changes 16 April 2012.
- Addition of pollution studies and reduction programs added on 28 November 2008.
- Scheduled Activity and Waste Classification structure changed on 17 October 2008.
- Reformatted licence including specification for cover material, litter control and other operational processes 20 November 2007.
- Clarification of water pollution prevention requirements on 11 October 2005.

3 REVIEW OF LANDFILL MONITORING DATA

3.1 GROUNDWATER MONITORING

Site investigations resulting from Council's Environment Application lodged with the State Government on 01 April 2012, have confirmed a predominant approximate south-southwest groundwater flow direction. The groundwater flow direction should be used to contextualise monitoring bore locations and any elevated results, please refer to the sites Environmental Monitoring Locations located in Annexure A of this document.

3.1.1 Tabulated Results

Table 3.1.1(a) Quarterly analyte testing results for 28 August 2014 *Note: Bore destroyed #Note: no access

Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	1100	756	365	454	#	389	145	17	dry	183	429	503	627	480	246	779
Calcium	mg/L	*	349	396	109	92	#	156	20	5	dry	25	118	216	208	101	83	123
Chloride	mg/L	*	1220	1370	708	227	#	349	42	58	dry	36	616	238	902	531	407	120
Conductivity	µS/cm	*	5330	5490	2960	3140	#	2160	520	283	dry	508	3200	2140	4070	2510	1660	5040
Magnesium	mg/L	*	212	222	69	83	#	60	14	3	dry	11	87	66	165	80	46	135
Nitrogen	mg/L	*	0.02	0.02	<0.01	<0.01	#	0.02	0.01	0.02	dry	0.02	0.01	0.78	0.01	0.02	0.01	0.13
Potassium	mg/L	*	3	2	<1	<1	#	<1	<1	<1	dry	3	<1	5	2	1	2	<1
Sodium	mg/L	*	682	544	445	502	#	160	48	35	dry	53	401	202	520	412	194	825
Water Level	m	*	5.12	0.65	2.02	2.5	#	7.36	7.41	7.46	dry	2.66	2.26	2.7	4.05	6.36	2.74	1.56
Sulfate	mg/L	*	174	201	209	227	#	122	32	13	dry	18	202	398	294	111	407	315
TDS	mg/L	*	3040	3540	1710	1770	#	1180	280	192	dry	320	1810	1430	2430	1340	904	2820
TOC	mg/L	*	6	5	1	1	#	2	2	4	dry	11	2	2	2	<1	<1	5
pH	pH	*	6.7	6.6	7.1	7.2	#	7.1	7.1	5.6	dry	7.3	6.8	6.5	6.7	7	7.4	6.9

Table 3.1.1(b) Quarterly analyte testing results for 24 November 2014 *Note: Bore destroyed

Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	1120	761	376	454	278	440	284	44	dry	566	505	365	634	475	248	794
Calcium	mg/L	*	347	400	117	97	59	234	40	6	dry	136	134	104	210	96	90	130
Chloride	mg/L	*	1260	1390	704	698	14	553	53	36	dry	709	710	252	923	523	424	1150
Conductivity	µS/cm	*	5250	5290	2890	3080	578	240	1090	251	dry	3670	3140	1510	4020	2560	1640	4940
Magnesium	mg/L	*	198	211	67	81	20	75	22	3	dry	99	88	37	153	68	45	130
Nitrogen	mg/L	*	0.02	0.03	0.02	0.02	0.02	0.05	0.03	0.03	dry	0.02	0.02	1.69	0.02	0.02	0.04	0.09
Potassium	mg/L	*	3	2	1	<1	<1	<1	<1	<1	dry	<1	<1	4	2	1	2	<1
Sodium	mg/L	*	618	506	449	499	37	178	84	38	dry	420	423	163	459	338	188	790
Water Level	m	*	5	0.63	1.9	2.4	11.7	7.73	7.49	10.9	dry	2.73	2.26	3.5	4.15	6.33	3.07	1.51
Sulfate	mg/L	*	187	222	225	246	24	155	42	15	dry	220	223	93	326	116	28	329
TDS	mg/L	*	3220	3450	1630	1750	406	1620	455	213	dry	1880	1800	776	2430	1350	1000	2710
TOC	mg/L	*	<1	<1	<1	<1	<1	<1	<1	<1	dry	<1	<1	1	<1	<1	<1	<1
pH	pH	*	6.6	6.6	6.8	7	7.2	6.9	7.2	5.8	dry	6.8	6.9	6.4	6.7	7	7.1	6.8

Table 3.1.1(c) Quarterly analyte testing results for 13 February 2015 *Note: Bore destroyed

Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	1050	714	353	428	84	430	186	39	dry	614	483	409	596	111	240	716
Calcium	mg/L	*	295	337	94	77	10	176	22	4	dry	136	114	109	177	72	79	110
Chloride	mg/L	*	1180	1320	644	648	16	416	40	29	dry	753	676	256	875	472	398	1030
Conductivity	µS/cm	*	5220	5370	2840	2990	245	2280	579	243	dry	3220	3080	1650	3910	2300	1690	4050
Magnesium	mg/L	*	194	208	61	75	4	67	16	2	dry	116	87	45	154	66	46	120
Nitrogen	mg/L	*	<0.01	0.01	0.05	0.01	0.02	0.04	0.06	<0.01	dry	0.02	<0.01	1.28	<0.01	<0.01	0.01	0.22
Potassium	mg/L	*	3	2	<1	<1	<1	<1	<1	<1	dry	<1	<1	3	1	<1	2	1
Sodium	mg/L	*	744	614	497	569	34	214	66	42	dry	554	524	202	580	400	228	916
Water Level	m	*	5.02	0.57	1.9	2.38	4.55	7.53	7.39	11	dry	2.56	2.12	3.05	4	6.28	2.58	1.34
Sulfate	mg/L	*	165	172	171	220	13	127	31	12	dry	215	192	104	278	96	25	262
TDS	mg/L	*	2960	3230	1620	1600	296	1110	299	198	dry	1940	1630	912	2250	1220	968	2400
TOC	mg/L	*	7	4	<1	1	7	<2	2	<1	dry	<3	<1	8	<1	<1	<1	5
pH	pH	*	6.6	6.6	6.6	6.9	6	6.8	6.7	5.4	dry	6.6	6.7	6.3	6.6	6.8	6.8	6.7

Table 3.1.1(d) Quarterly analyte testing results for 25 May 2015 *Note: Bore destroyed

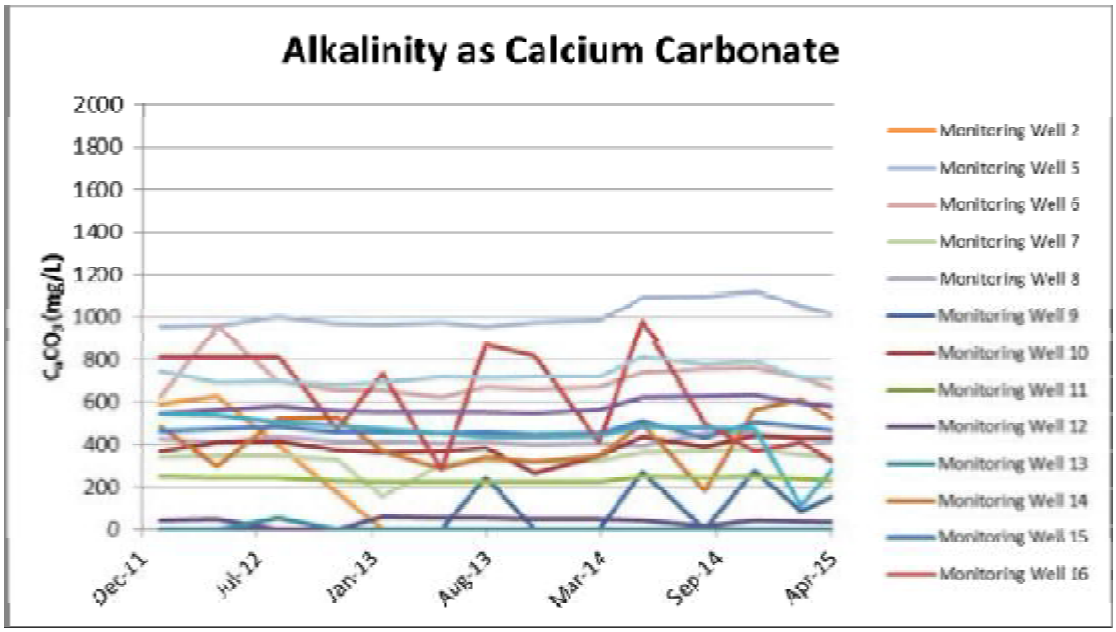
Analyte		Monitoring Points																
	Units	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alkalinity	mg/L	*	987	617	327	398	210	432	159	32	dry	440	453	239	566	430	218	707
Calcium	mg/L	*	302	338	104	91	62	181	26	7	dry	37	153	77	220	97	104	120
Chloride	mg/L	*	1070	1200	559	586	19	320	34	42	dry	109	615	228	816	473	388	986
Conductivity	µS/cm	*	5440	5450	2830	3120	516	2530	529	282	dry	1590	3030	1380	4100	1300	1750	4980
Magnesium	mg/L	*	199	214	62	80	14	64	19	4	dry	22	100	42	170	77	52	125
Nitrogen	mg/L	*	0.03	0.03	0.04	0.02	0.04	0.05	0.06	0.14	dry	0.04	0.01	0.54	<0.01	0.02	0.13	0.1
Potassium	mg/L	*	3	2	<1	<1	<1	<1	<1	<1	dry	3	3	2	2	1	1	<1
Sodium	mg/L	*	602	496	391	452	27	176	57	40	dry	230	433	158	494	347	187	780
Water Level	m	*	4.77	0.49	1.7	2.2	10.59	7.25	6.95	10.16	dry	2.52	2.02	3.04	3.93	6.08	2.74	1.36
Sulfate	mg/L	*	174	207	178	218	13	129	30	15	dry	42	205	100	319	112	25	298
TDS	mg/L	*	2900	3130	1400	1600	300	988	260	221	dry	692	1660	686	2160	1300	834	2540
TOC	mg/L	*	6	5	<1	2	2	2	2	1	dry	6.8	2	7	5	2	<1	<5
pH	pH	*	6.6	6.9	7.3	7.4	7.10	7	7.1	5.7	dry	9	7.4	6.3	6.8	7.1	7.4	6.8

Table 3.1.1(e) Annual analyte testing 13 February 2015 results *Note: Bore destroyed

Analyte	Units	Monitoring Points																
		2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aluminium	mg/L	*	1.7	0.19	0.08	0.12	8.087	0.06	0.07	0.34	Dry	0.52	0.03	2.31	0.81	0.26	0.29	0.33
Arsenic	mg/L	*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	Dry	<0.001	<0.001	0.003	0.001	<0.001	<0.001	0.002
Barium	mg/L	*	0.006	0.015	0.005	0.09	0.043	0.015	0.002	<0.001	Dry	0.051	0.012	0.263	0.005	0.016	0.144	0.047
Benzene	µg/	*	<1	<1	<1	<1	<1	<2	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1
Cadmium	mg/L	*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	Dry	<0.00 01	<0.0001	0.0002	<0.00 01	<0.0001	0.0002	<0.00 01
Chromium (hex.)	mg/L	*	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	Dry	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01
Chromium (total)	mg/L	*	0.001	<0.01	<0.001	<0.001	0.001	0.001	<0.001	<0.001	Dry	0.002	0.001	0.003	<0.001	<0.001	0.001	<0.001
Cobalt	mg/L	*	<0.001	0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	Dry	0.002	<0.001	0.024	<0.001	<0.001	<0.001	0.008
Copper	mg/L	*	0.003	0.003	0.003	0.006	0.012	0.002	0.001	<0.001	Dry	<0.001	0.002	0.022	0.004	0.012	0.016	0.007
Ethyl Benzene	µg/L	*	<2	<2	<2	<2	<2	<2	0.001	2	Dry	<2	<2	<2	<2	<2	<2	<2
Fluoride	mg/L	*	0.5	0.5	0.5	0.9	0.2	0.4	0.7	0.3	Dry	0.7	0.7	0.2	0.4	0.5	0.4	0.9
Lead	mg/L	*	0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	Dry	<0.001	0.001	0.007	0.002	<0.001	0.004	0.002
Manganese	mg/L	*	0.045	0.302	0.006	0.057	0.059	0.28	0.019	0.007	Dry	0.125	0.003	4.38	0.043	0.077	0.526	1.68
Mercury	mg/L	*	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	Dry	<0.00 01	0.0001	<0.0001	0.0001	0.0001	0.0001	<0.00 01
Nitrate	mg/L	*	<0.01	<0.01	<0.01	0.07	0.33	<0.01	0.02	4.82	Dry	<0.01	0.01	0.06	0.11	<0.01	0.3	0.6
Nitrite	mg/L	*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Dry	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
OCP	µg/	*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
OPP	µg/	*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAH	µg/	*	<1	<1	<1	<1	<1	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/	*	<2	<2	<2	<2	<2	<2	<2	<2	Dry	<2	<2	<2	<2	<2	<2	<2
TPH	µg/	*	<50	<50	<50	<50	<50	<50	<50	<50	Dry	<50	<50	<50	<50	<50	<50	<50
Total Phenolics	mg/L	*	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	Dry	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05
Xylene	µg/	*	<2	<2	<2	<2	<2	<2	<2	<2	Dry	<2	<2	<2	<1	<2	<2	<2
Zinc	mg/L	*	0.011	0.008	0.005	0.009	0.021	0.008	0.01	<0.005	Dry	<0.005	0.006	0.109	0.015	0.009	0.018	0.025

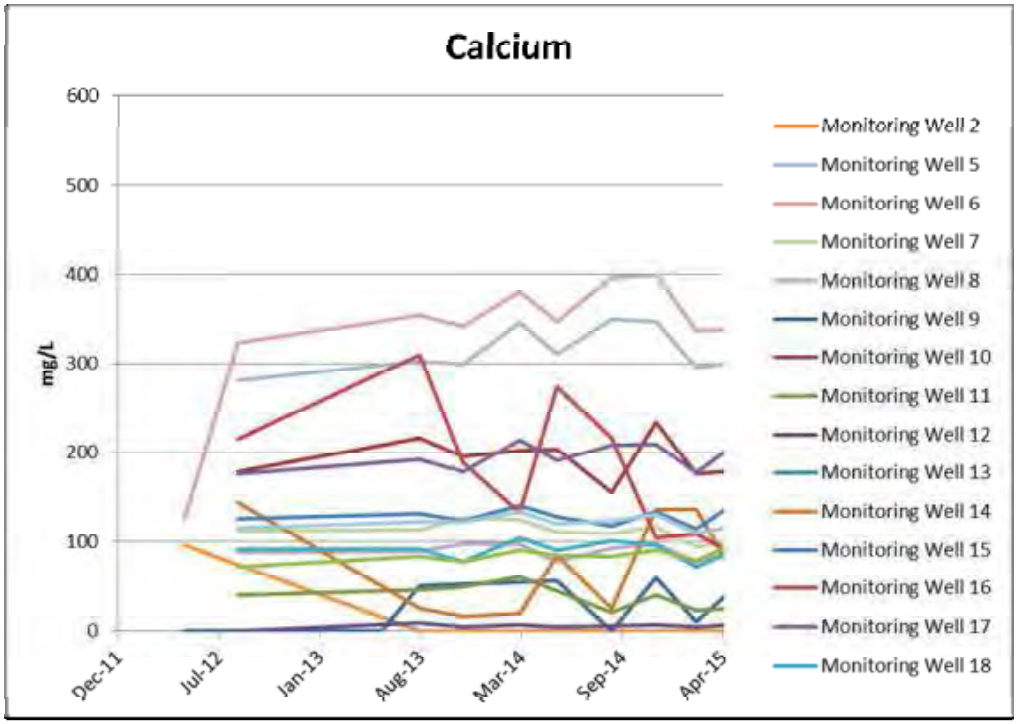
3.1.2 Data Presentation – Quarterly Monitoring

Alkalinity results presentation



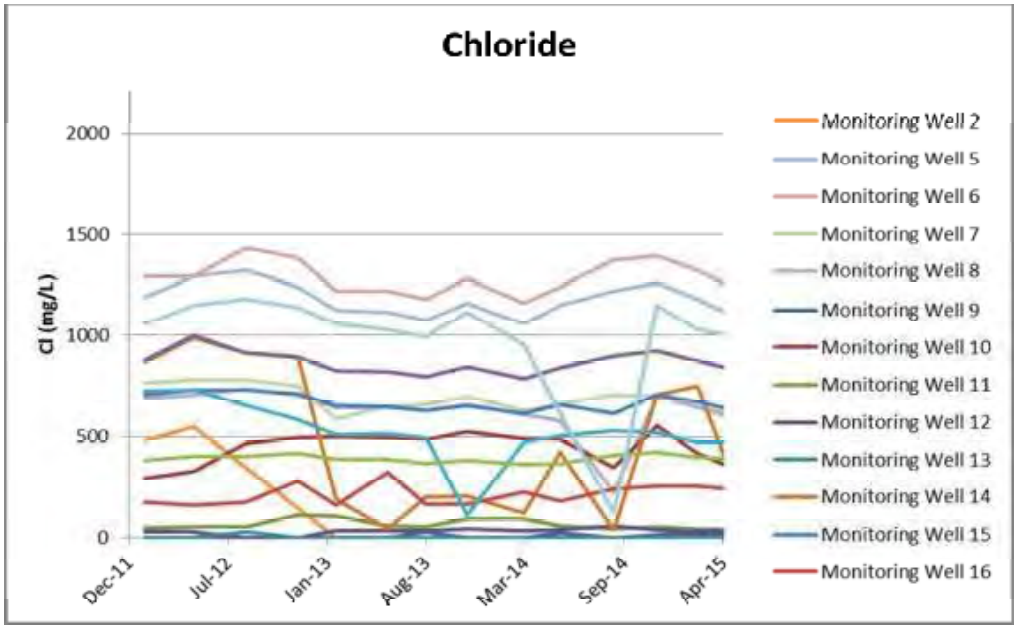
Increased alkalinity levels can be caused by many chemical processes including the denitrification process common in landfill leachate. Denitrification is the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. This process produces calcium carbonate as a by-product. The stability of the calcium carbonate in the groundwater monitoring wells over the sample period shows that it is unlikely that the denitrification process caused by leachate ingress is taking place in the groundwater around the site. Nonetheless, the calcium carbonate levels are relatively high and quite "hard" in plumbing terms and continued monitoring is necessary to scrutinise for any increased value trends. It should be noted that many natural groundwater sources often contain much higher alkalinity levels than this site.

Calcium results presentation



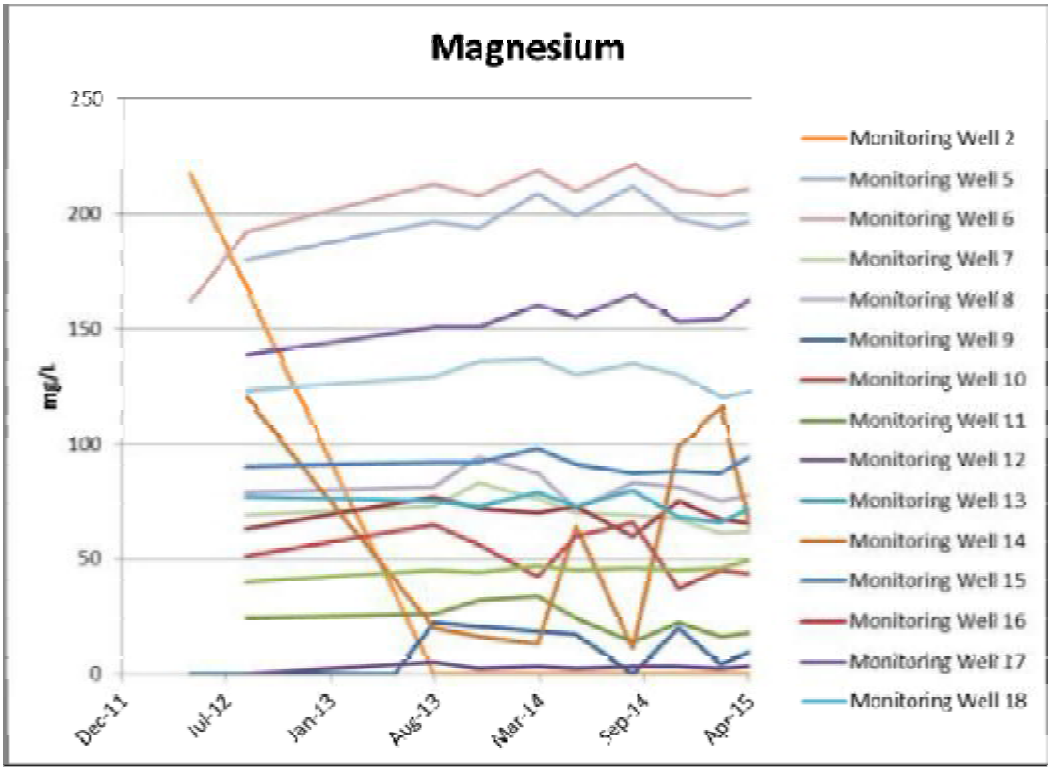
The groundwater monitoring wells show a consistent stable trend for calcium levels. The calcium levels sampled would be considered "hard" water in the region of 120-180mg/L. This is consistent with the presented results for alkalinity.

Chloride results presentation



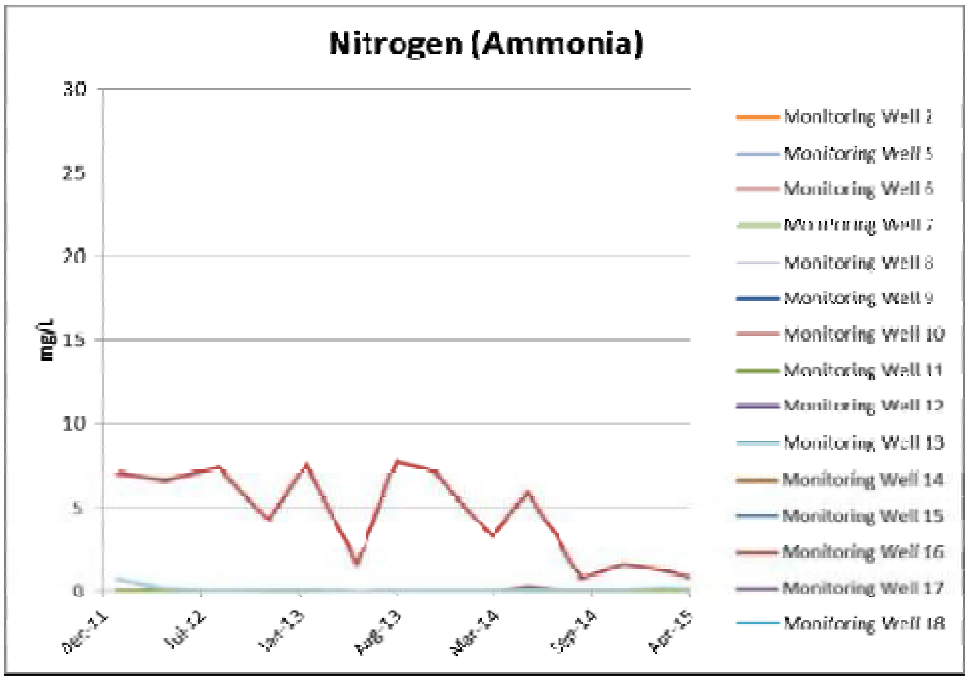
The trends realised through chloride monitoring have been in line with the historical levels over the data range available. Large quantities of inorganic ions such as chloride can be an indicator of leachate contamination of groundwater. A sudden increase in these ions can act as early warning system. The sampling history for chloride suggests that no significant spikes have occurred that has not returned to normal or historical levels and therefore leachate is not indicated in the groundwater network.

Magnesium results presentation



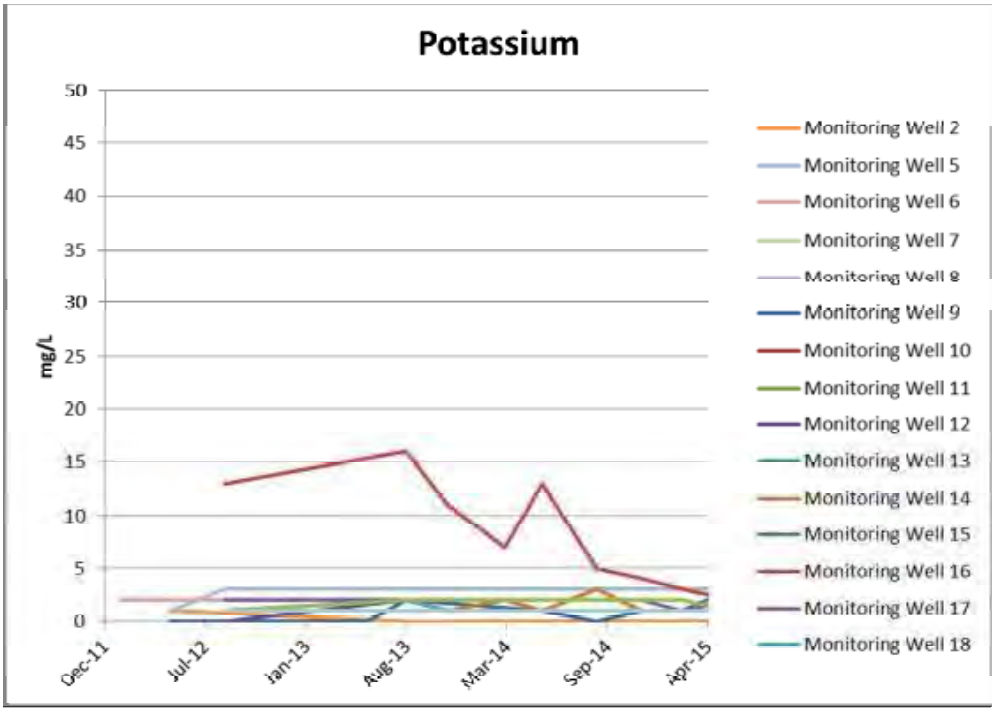
Groundwater monitoring well results are in line with historical levels and have maintained consistent levels. The magnesium levels sampled would be considered quite “hard” and consistent with other typical water hardness measures such as alkalinity and calcium.

Nitrogen as ammonia results presentation



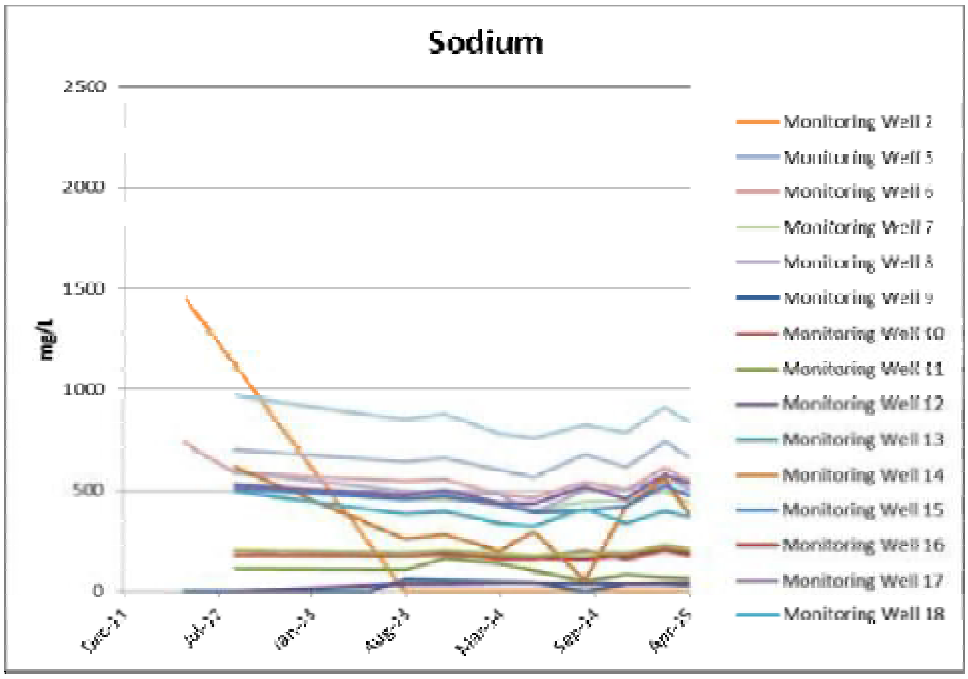
The groundwater monitoring wells indicate that ammonia levels in the groundwater are extremely low and often beneath the testing limits. However, monitoring point 16 has indicated a relatively higher result level, it is trending down, particularly in this reporting period. Considering that monitoring points 16 and 19 are arguably the most relevant with regard to groundwater movement from the site, the result must be monitored closely. Ammonia is perhaps the clearest indicator of leachate contamination and the results from monitoring point 16 should continue to be monitored in future sampling events to be sure that the relative higher levels are not indicative of leachate migration.

Potassium results presentation



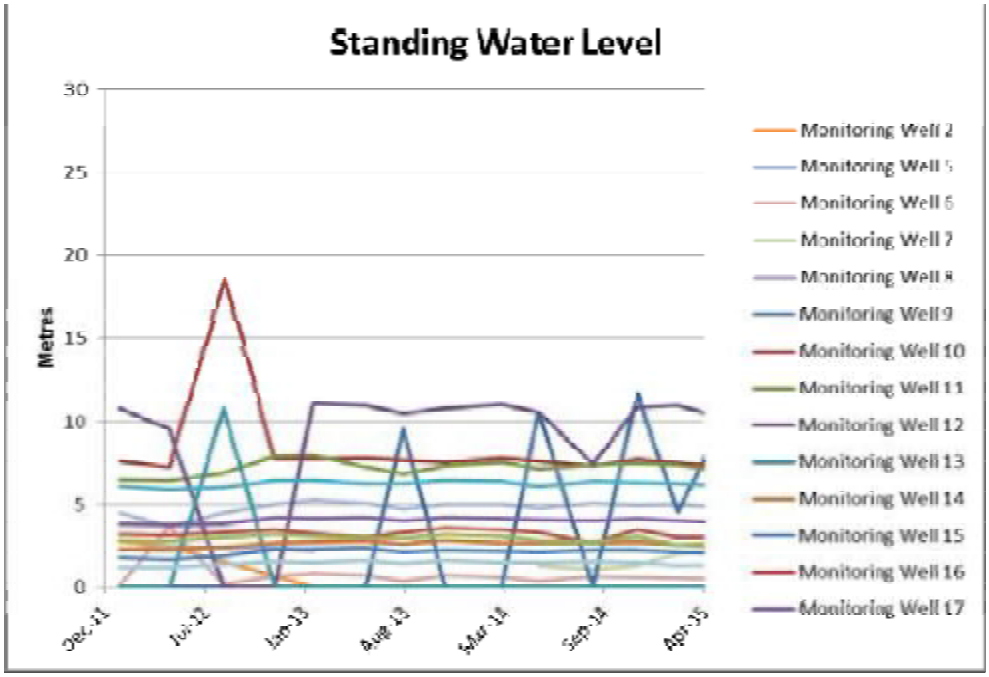
Potassium is present in groundwater systems outside coastal areas generally through weathering of clays and as a result of agriculture (leaching of fertiliser). Potassium may also be present in the breakdown of glass and especially cathode ray tubes. Groundwater monitoring wells indicate that potassium levels in the ground water are generally low over the available results period. Monitoring point 16 was reading higher than all other bores, but again is showing a positive downward trend.

Sodium results presentation



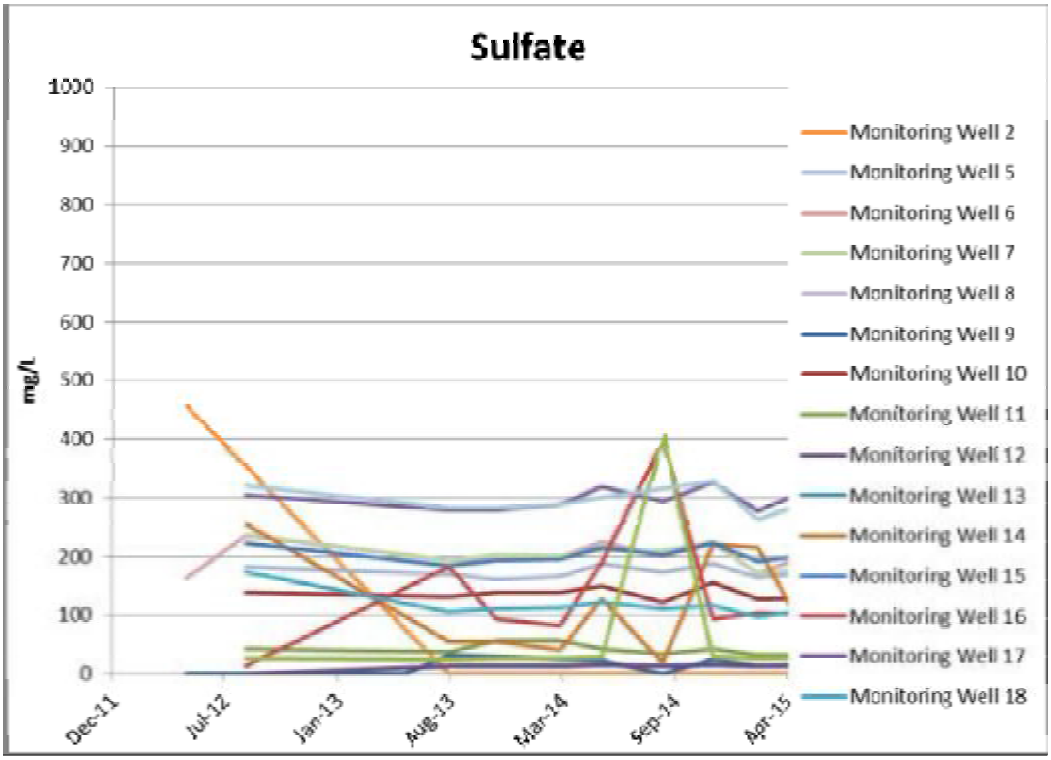
High sodium levels are indicative of leachate contamination infiltrating the groundwater. As presented, results for sodium have been stable over the history of data available. Notable monitoring well 16 is displaying low levels.

Standing water level presentation



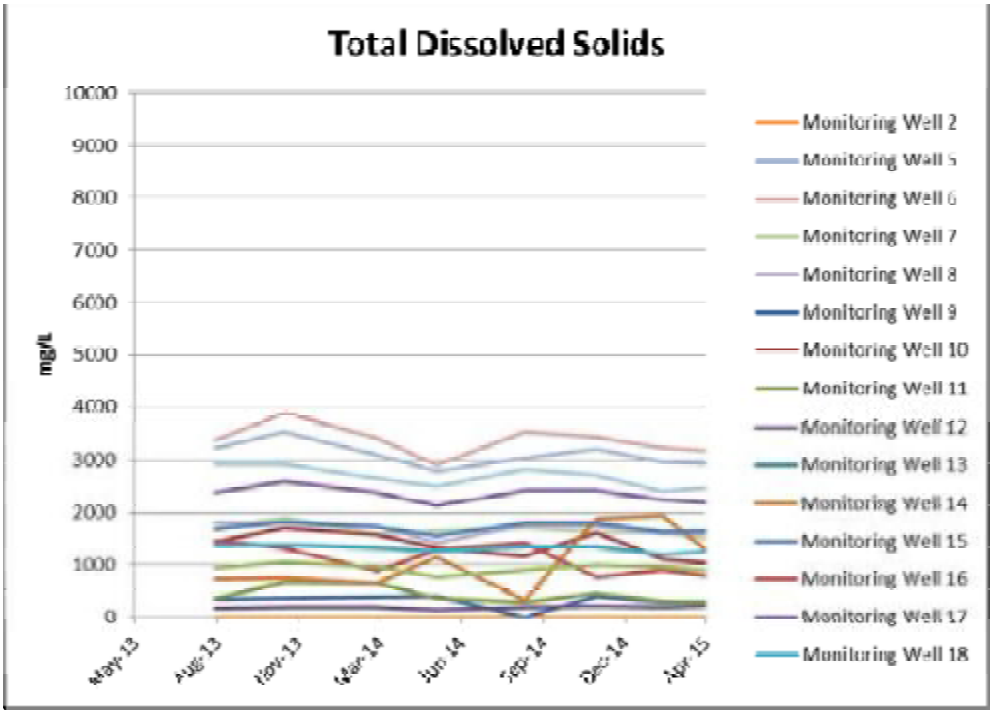
Groundwater level trends have been fairly stable, with the fluctuation over the 4 year testing period. It should be noted that some bores have run dry at periods.

Sulfate results presentation



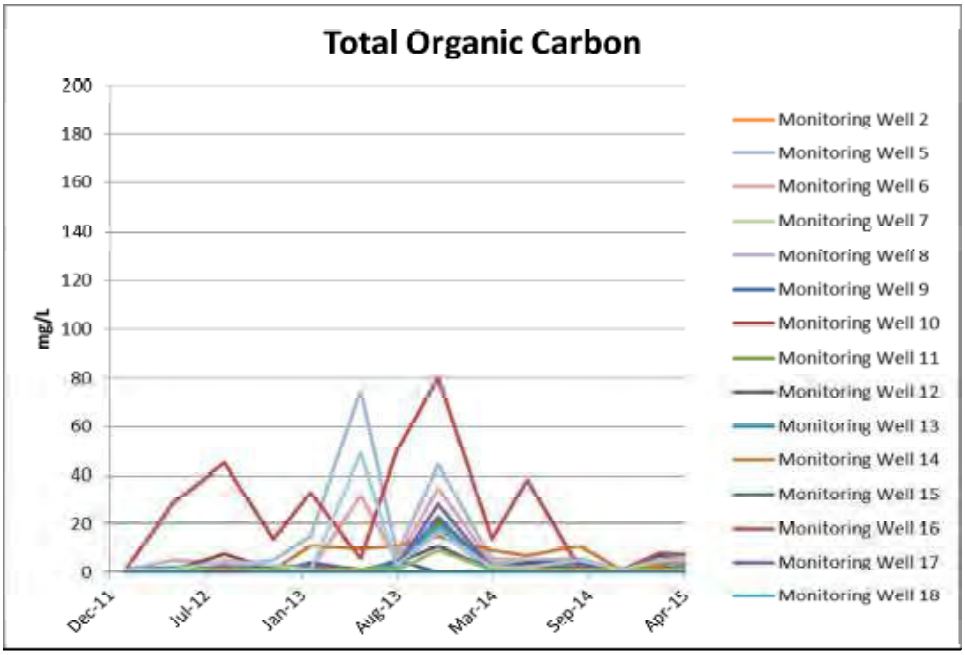
The *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500mg/L. The sulfate levels in the groundwater monitoring wells are in line with the historical levels and are generally below the drinkable water standard. Inorganic ions such as sulfate provide a good indication of groundwater contamination by landfill leachate. A sudden increase in these ions can act as early warning system, monitoring point 11 and 16 did spike, however they have returned to historic trends in subsequent sampling rounds.

Total dissolved solids results presentation



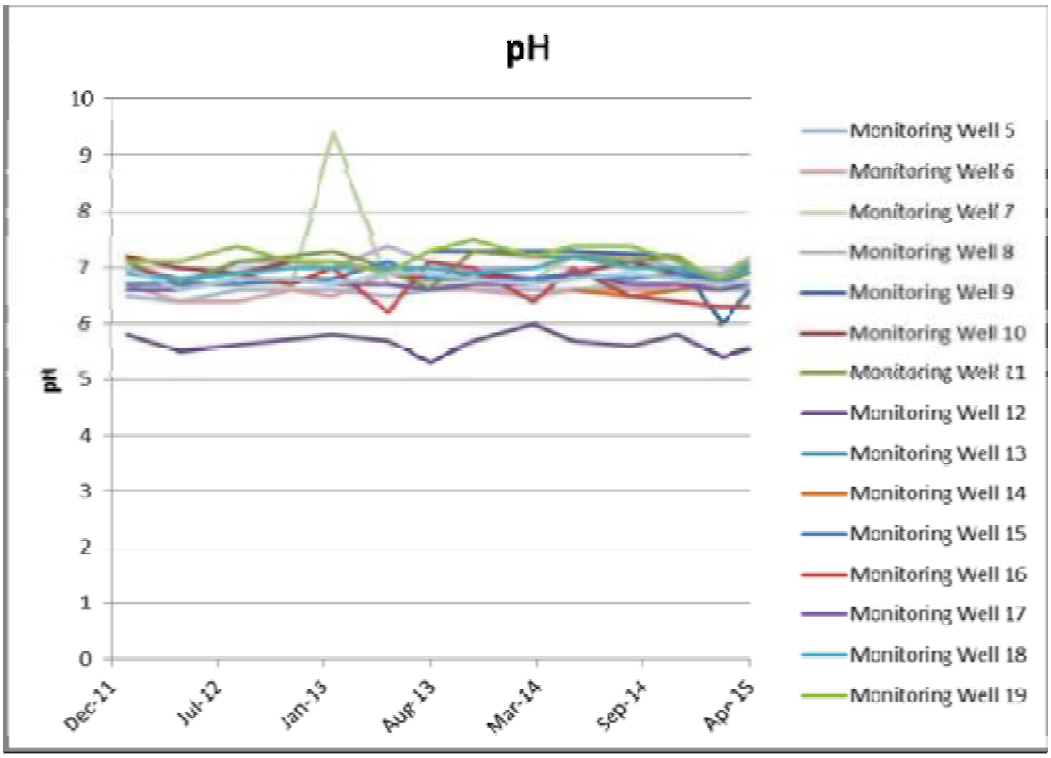
The trend for the quantity of dissolved solids has been fairly stable for the ground water monitoring wells over the reporting period, in line with historical trends. High levels of dissolved solids can be sourced from salts derived from leachate infiltration.

Total organic carbon results presentation



Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of groundwater contamination by organic compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained relatively stable over the three year results period. Monitoring point 16 has also stabilised during this reporting period.

pH results presentation

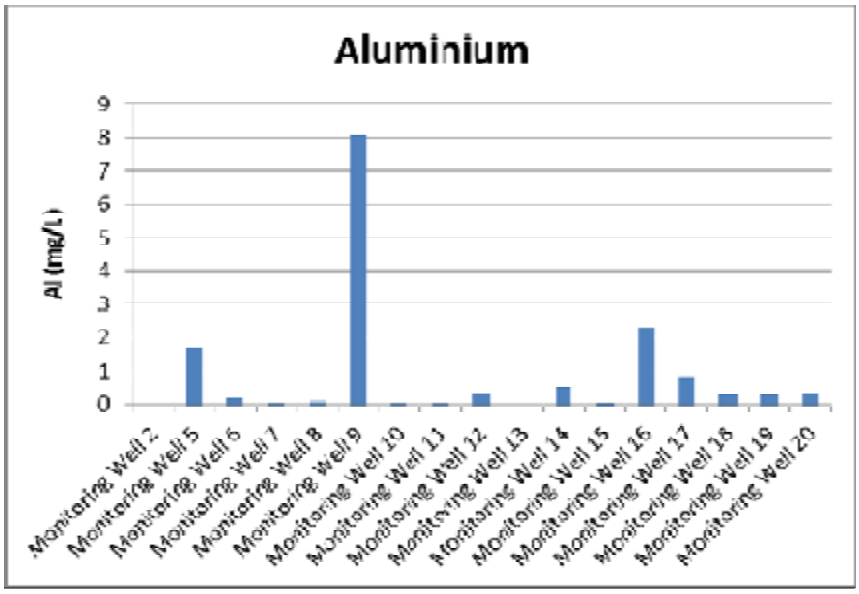


The pH levels indicated in the groundwater monitoring wells have been extremely stable over the three year sample period. The fluctuations have been very small except with minor anomalies that invariably return to a stable trend. The groundwater monitoring wells indicate that the historical pH of the groundwater has been maintained over the sample period.

3.1.3 Data Presentation – Annual Monitoring

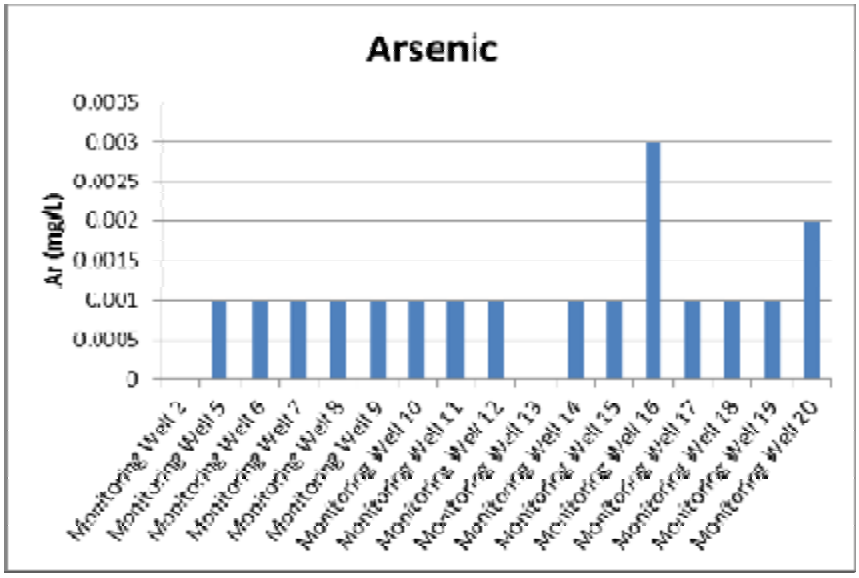
Note: Monitoring Point 2 is damaged and is scheduled for repair and Monitoring Point 13 was dry for the round of annual testing.

Aluminium results presentation



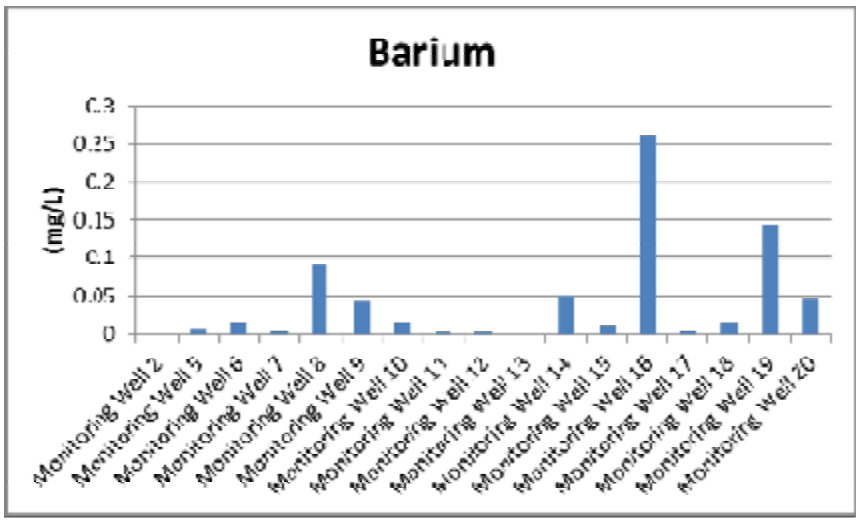
Aluminium levels in the sampled groundwater monitoring points 5, 9, and 16 are relatively higher than the other point's onsite. Anthropogenic sources of aluminium in groundwater are generally related to low pH runoff and colliery based leachate.

Arsenic results presentation



The US EPA sets the maximum contaminant level of arsenic in groundwater at 0.05mg/L. Therefore amount of arsenic found in the groundwater monitoring bores over the reporting period is extremely low. In fact arsenic levels are below detectable limits in almost all of the test results, the only exceptions being monitoring point 16 and 20.

Barium results presentation

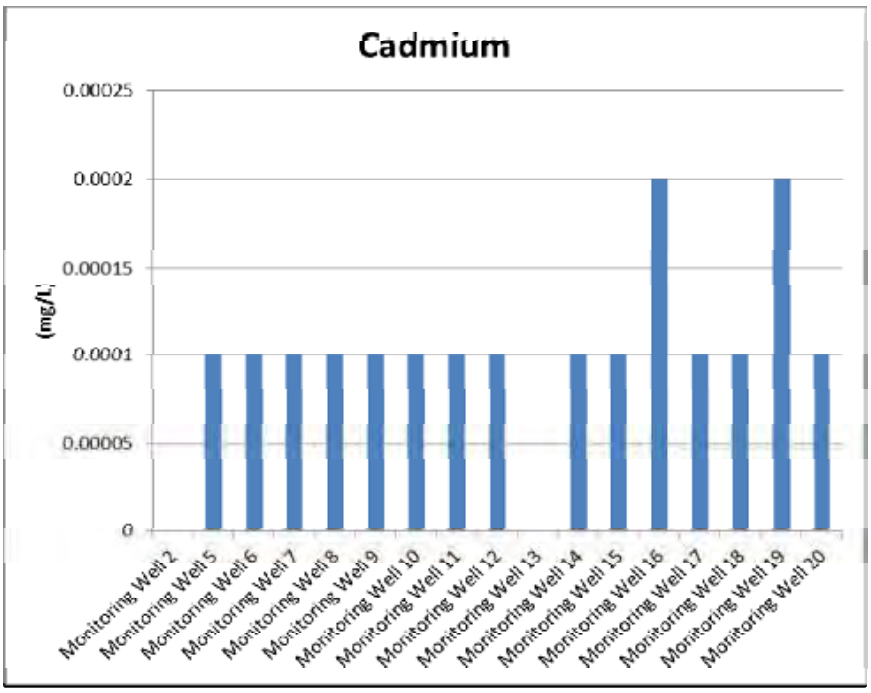


The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 2 mg/L of barium is safe for consumption. Anthropogenic sources of barium in groundwater include bleaches, dyes and drillers mud. Barium levels are therefore extremely low and stable in the sites groundwater.

Benzene results presentation

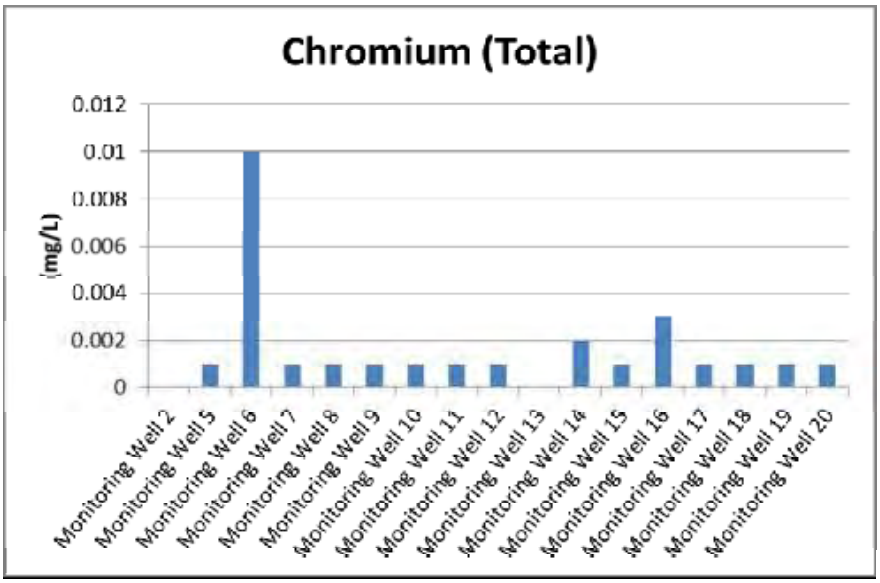
Benzene has not been modelled as every instance of sampling has not provided a result due to the concentration of benzene being below laboratory testing thresholds.

Cadmium results presentation



The US EPA sets the maximum contaminant level of cadmium in groundwater at 0.01mg/L. Cadmium levels present in the ground water monitoring bores is extremely small. Cadmium levels are always below 0.01 mg/L and below detectable limits in the majority of readings taken during the reporting period.

Chromium results presentation

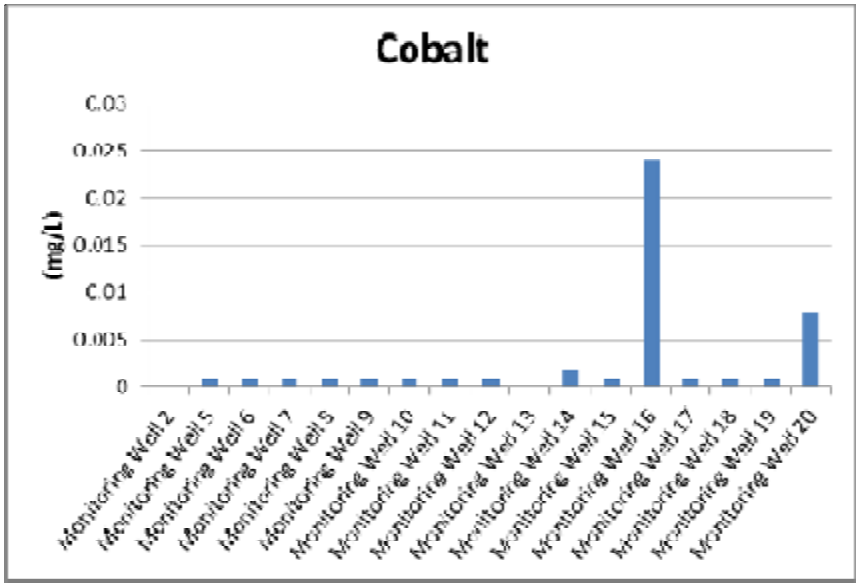


The US EPA sets the maximum contaminant level of chromium in groundwater at 0.05mg/L The levels of chromium detected in the ground water monitoring wells over the reporting period have been extremely low. Chromium levels are below detectable limits in the majority of the samples.

Chromium (hexavalent) results presentation

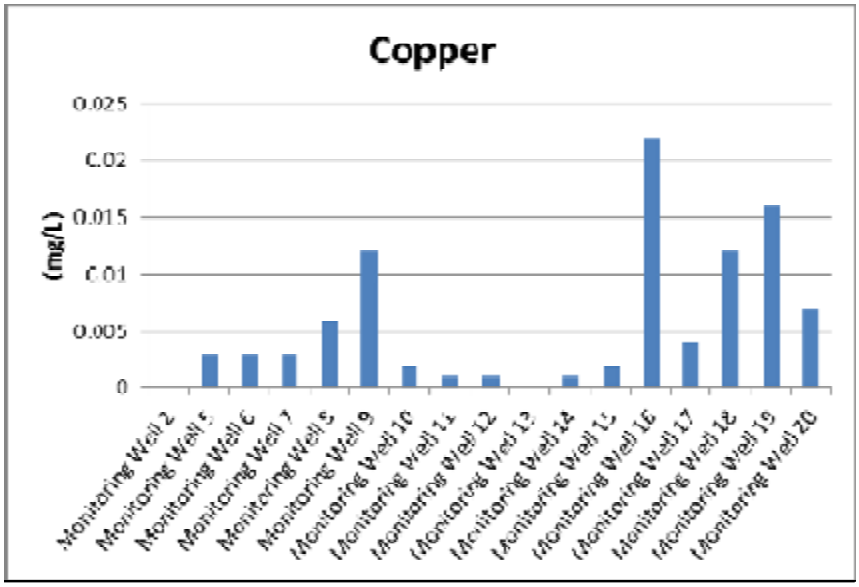
Hexavalent chromium has not been modelled as every instance of sampling has not provided a result due to the concentration of hexavalent chromium being below laboratory testing thresholds.

Cobalt results presentation



Anthropogenic sources of cobalt in the environment include agricultural runoff and sewage effluent.

Copper results presentation

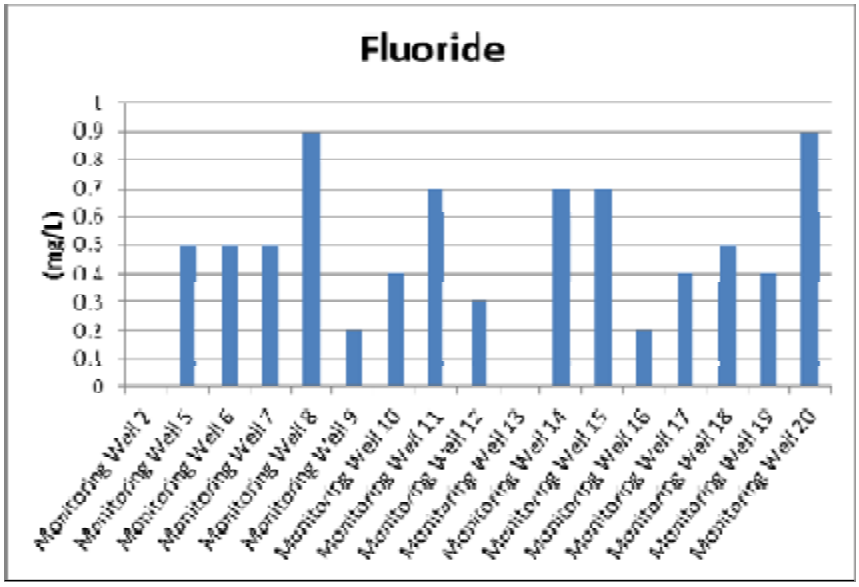


Tested results from the ground water monitoring wells show an extremely small amount of copper. The *2011 Australian Drinking Water Guidelines 6* prescribes an aesthetic limit of 1 mg/L of copper in drinking water. Clearly, the results therefore indicate that copper contamination is not evident.

Ethyl Benzene results presentation

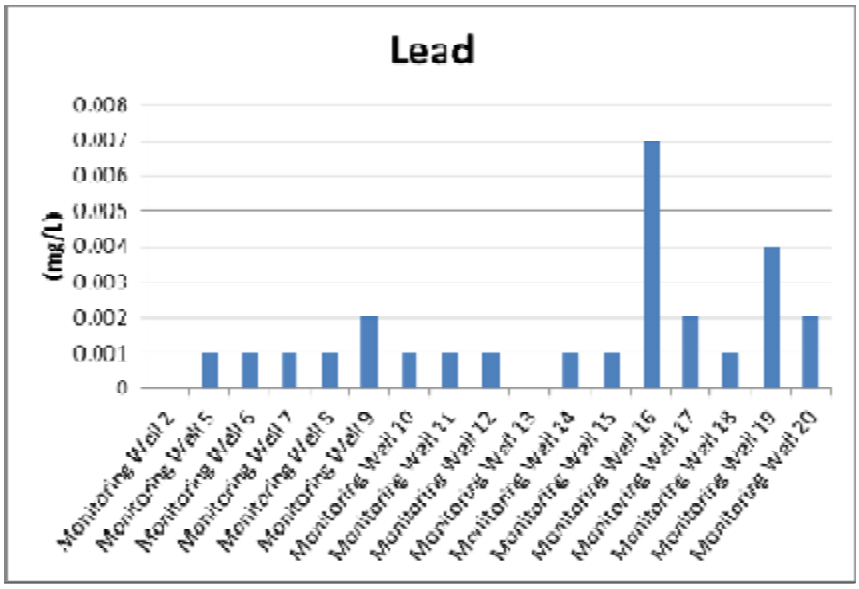
Ethyl benzene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Fluoride results presentation



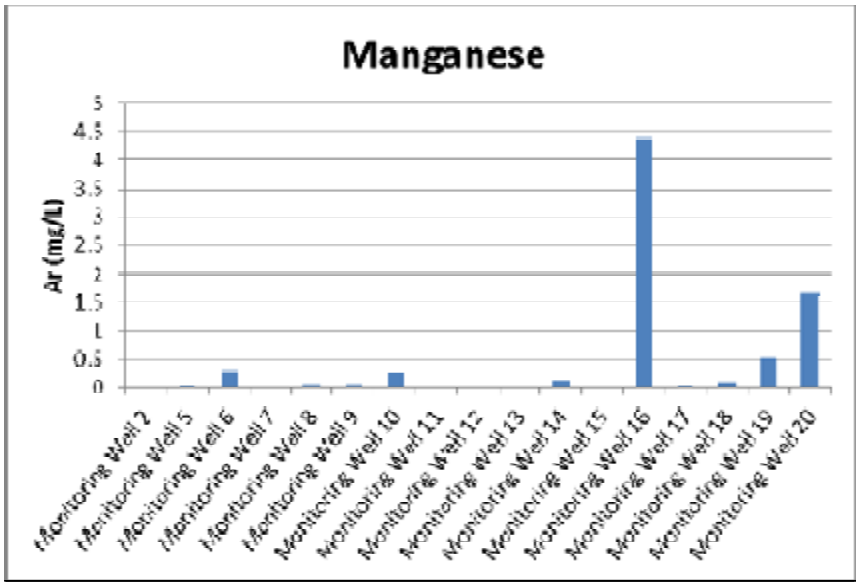
Industrial emissions are understood to be the primary anthropogenic pathway for fluoride to enter the environment. The US EPA sets the maximum contaminant level of fluoride in groundwater at 4 mg/L. Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L.

Lead results presentation



Heavy metal contamination in the groundwater in the form of lead is at very low levels.

Manganese results presentation

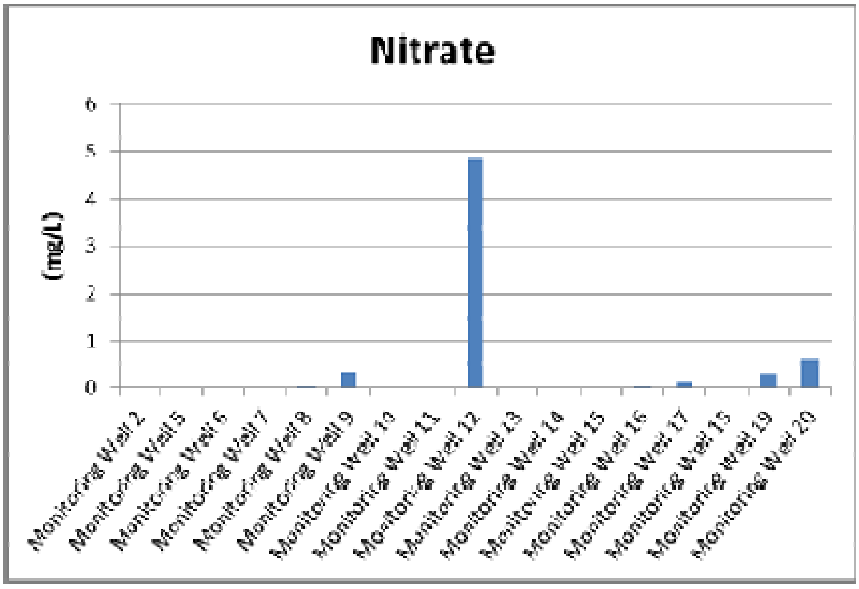


The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 0.5 mg/L of manganese is safe for consumption. Manganese can be a strong indicator of landfill leachate in groundwater leached from hazardous waste sites and often derived from battery disposal. Monitoring points 16 and 20 should continue to be closely monitored in future sampling events.

Mercury results presentation

Mercury was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Nitrate results presentation



The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 50 mg/L of nitrate is safe for consumption. Denitrification is a process common in leachate treatment where the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form occurs. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. The relatively low levels of nitrate sampled, indicate that the denitrification process is not evident and landfill leachate is not present in the groundwater.

Nitrite results presentation

Nitrification is a twostep aerobic biological process where bacteria known as nitrosomonas convert ammonia and ammonium to nitrite. Next, bacteria called nitrobacter finish the conversion of nitrite to nitrate. The conversion of nitrite to nitrate is generally very fast and nitrite levels are therefore invariably quite low. More toxic than nitrate, nitrite is an indicator of ammonia (major constituent of landfill leachate) that has not been biologically processed (into nitrate). Nitrite levels above 3 mg/L are considered potentially harmful by the *2011 Australian Drinking Water Guidelines 6*.

Nitrite levels found in the ground water monitoring wells are extremely small and below detectable limits in almost all of the samples taken. Monitoring points 15 and 16 were the only two points with detectable levels ay 0.01 mg/L, all other monitoring points presented < 0.01mg/L.

Organochlorine Pesticides results presentation

Organochlorine pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Organophosphate Pesticides results presentation

Organophosphate pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Polycyclic Aromatic Hydrocarbons results presentation

Polycyclic aromatic hydrocarbons were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Toluene results presentation

Toluene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Total Petroleum Hydrocarbons results presentation

Total petroleum hydrocarbons were not detected at any level in the ground water monitoring points during the reporting period.

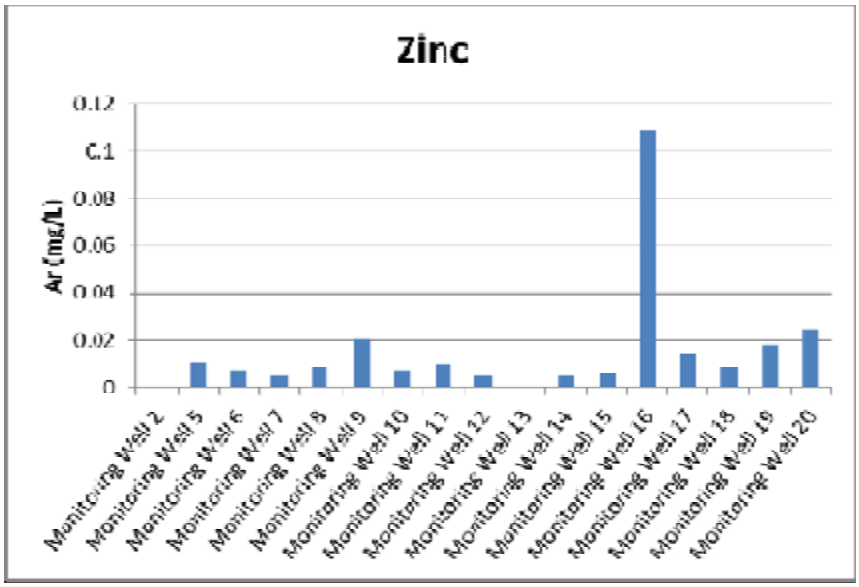
Total Phenolics results presentation

Total phenolics were detected at minimal levels of 0.05mg/L at monitoring point 18 and Point 20 the ground water monitoring wells during the reporting period. No other monitoring points detected this analyte.

Xylene results presentation

Xylene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Zinc results presentation



The *2011 Australian Drinking Water Guidelines 6* states that for aesthetic reasons a maximum of 3 mg/L of zinc is desirable for consumption. Landfill sites can be an anthropogenic source of zinc in groundwater, however despite the extremely low levels of zinc detected monitoring point 16 should be further monitored due to the display of levels higher than the other surrounding points.

3.1.4 Groundwater Testing Results Interpretation

Results indicate that there has been no definitive increase in concentration levels for any of the analytes detailed when compared to the historical results and trends. The following table indicates the analytes that should be closely monitored for developing trends over the next twelve months:

Analyte	Monitoring Point	Regime	Next Sample
Cadmium	16, 19	Annual	February 2016
Barium	16	Annual	February 2016
Manganese	16, 19, 20	Annual	February 2016

On reflection, key indicators of landfill leachate's potential ingress into ground water including ammonia, nitrate, nitrite levels and other less poignant indicators as tested do not conclude that that landfill leachate is entering the surrounding ground water system. However, the potentially anomalous results presenting in monitoring point 16 warrant continued scrutiny.

3.2 SURFACE WATER MONITORING

3.2.1 Tabulated Results

As per the sites EPL, annual sampling and sampling of each stormwater overflow event was undertaken with the following results:

Table 3.2.1 Stormwater overflow monitoring results for the reporting period

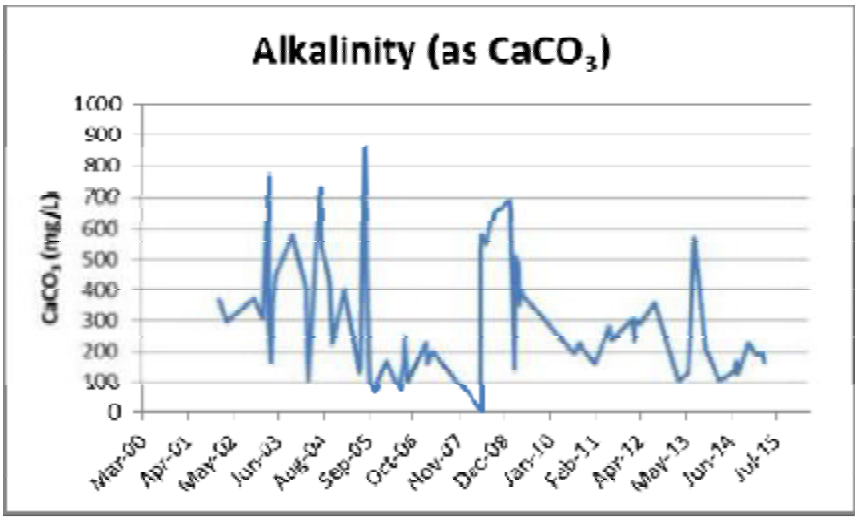
	Feb 2015	EPA Monitoring Location		
Analyte	Units	1	33	34
Alkalinity	mg/L	190	167	153
Ammonia	mg/L	0.07	0.02	0.01
Calcium	mg/L	28	41	31
Chloride	mg/L	71	37	45
Conductivity	µS/cm	670	499	481
Dissolved O_2	mg/L	6.14	8.12	3.33
Iron	mg/L	0.11	0.11	0.33
Fluoride	mg/L	0.4	0.2	0.2
Magnesium	mg/L	16	19	15
Nitrate	mg/L	1.39	0.07	<0.01
Potassium	mg/L	13	4	6
Sodium	mg/L	100	34	52
Sulfate	mg/L	29	27	14
Temperature	°C	22.9	21.3	21.5
TOC	mg/L	11	2	6
TP	mg/L	<0.05	<0.05	<0.05
TSS	mg/L	10	464	93.3
pH	pH	7.5	7.5	7.4

Additionally, overflow events were also sampled as per the sites EPL. With the following results:

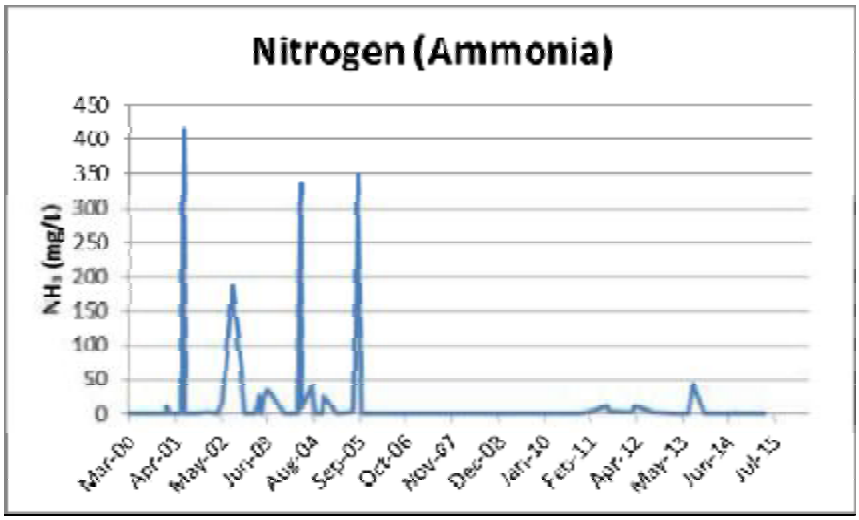
Analyte	Units	EPA Monitoring Point 1							
		29 July 14	19 Aug 14	27 Aug 14	5 Dec 14	29 Jan 15	13 Feb 15	8 Apr 15	21 Apr 15
Alkalinity	mg/L	134	166	126	229	202	190	193	162
Ammonia	mg/L	0.1	2.74	1.62	0.22	0.61	0.07	0.46	0.44
Calcium	mg/L	35	23	23	35	22	28	23	31
Chloride	mg/L	127	80	55	119	92	71	94	50
Conductivity	µS/cm	756	663	522	845	749	670	732	504
Dissolved O_2	mg/L	9.78	9	7.97	8.12	7.92	6.14	7.53	8.69
Iron	mg/L	<0.05	<0.61	0.38	0.07	0.09	0.11	0.14	0.18
Fluoride	mg/L	1.1	0.4	0.4	0.4	0.6	0.4	0.5	0.4
Magnesium	mg/L	20	14	13	20	16	16	16	14
Nitrate	mg/L	0.11	4.37	2.87	0.59	0.74	1.39	1.3	1.46
Potassium	mg/L	2	15	9	16	13	13	15	10
Sodium	mg/L	85	88	53	118	104	100	88	54
Sulfate	mg/L	41	25	<27	<33	34	29	24	24
Temperature	°C	12.8	13.9	17.5	25.5	20.1	22.9	18.4	14.9
TP	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TOC	mg/L	4	19	21	13	15	11	12	10
TSS	mg/L	10	80	88	20	17	10	39	5
pH	pH	8.1	8.2	7.8	7.1	7.8	7.5	8	8

3.2.2 Data Presentation

<u>Alkalinity results presentation</u>

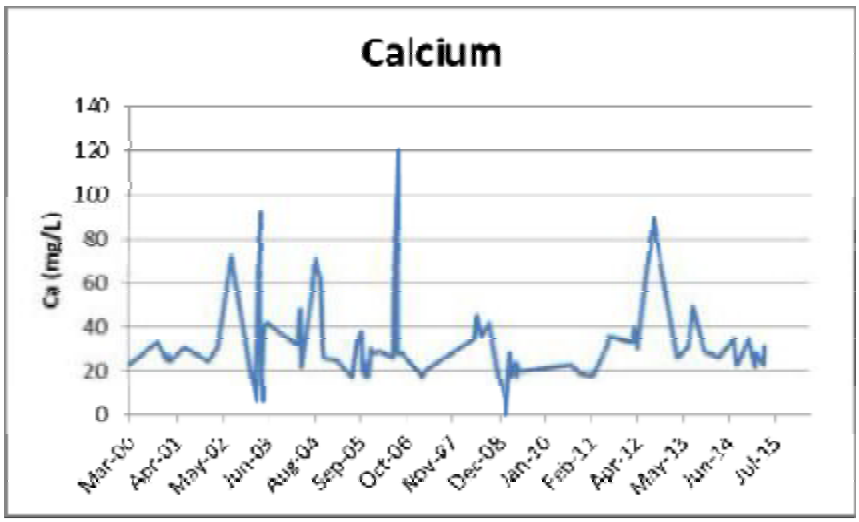


Ammonia results presentation

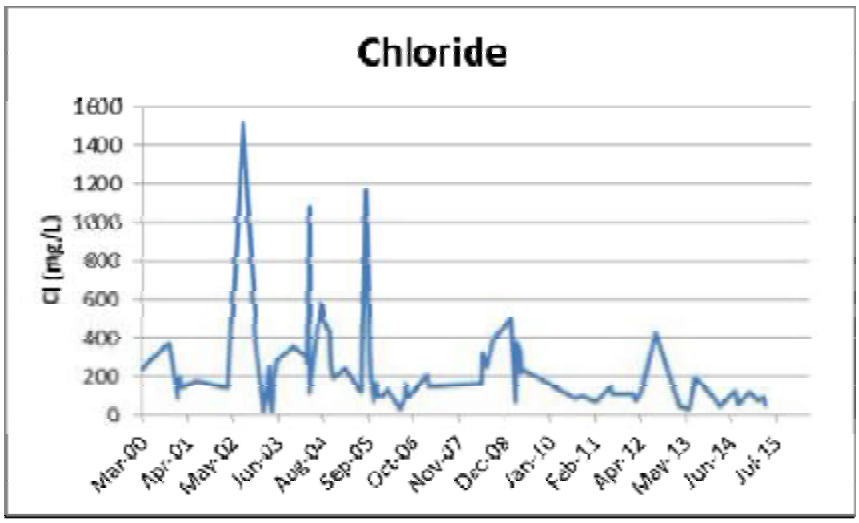


Increased alkalinity and ammonia levels can be caused by biological reactions in landfill leachate. The stability of results, particularly in regard to the reporting period indicates that leachate does not appear to be affecting the stormwater pond. The relatively high alkalinity levels coincide with natural groundwater levels in the area.

Calcium results presentation

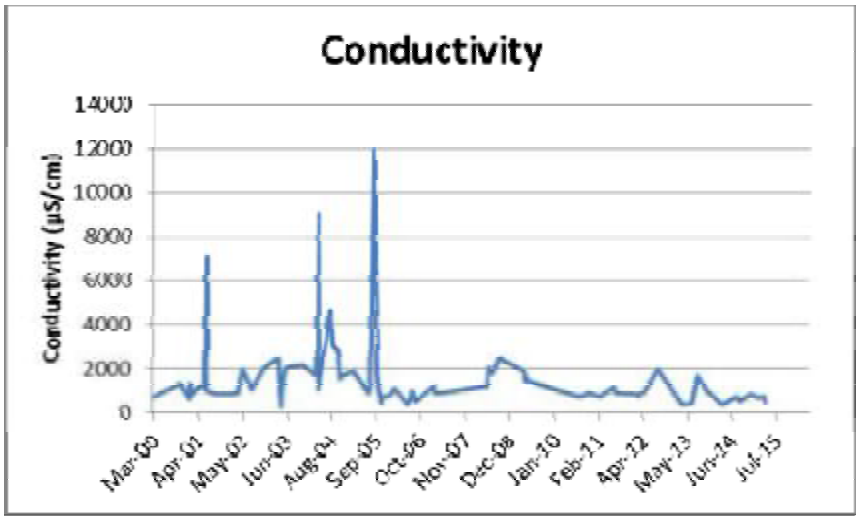


Chloride results presentation

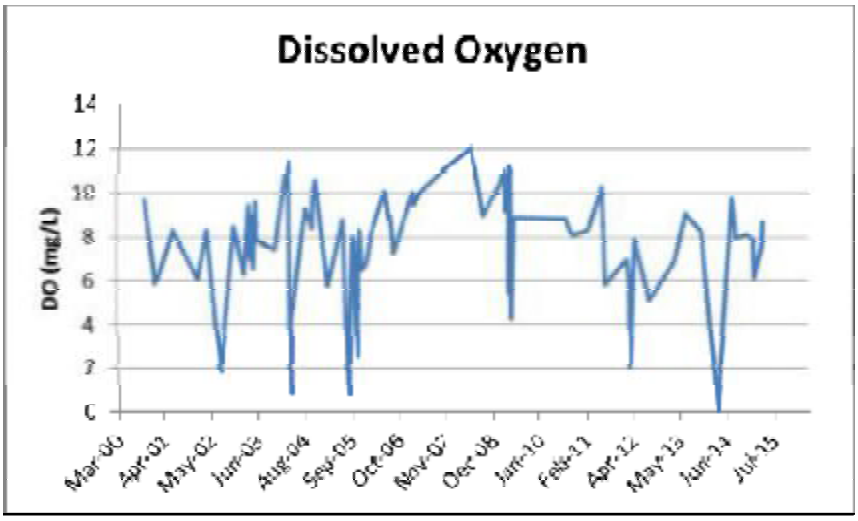


The calcium and chloride levels in the stormwater pond are invariably better than historical results. The levels sampled are also in line with the results sampled throughout the surrounding groundwater system.

Conductivity results presentation

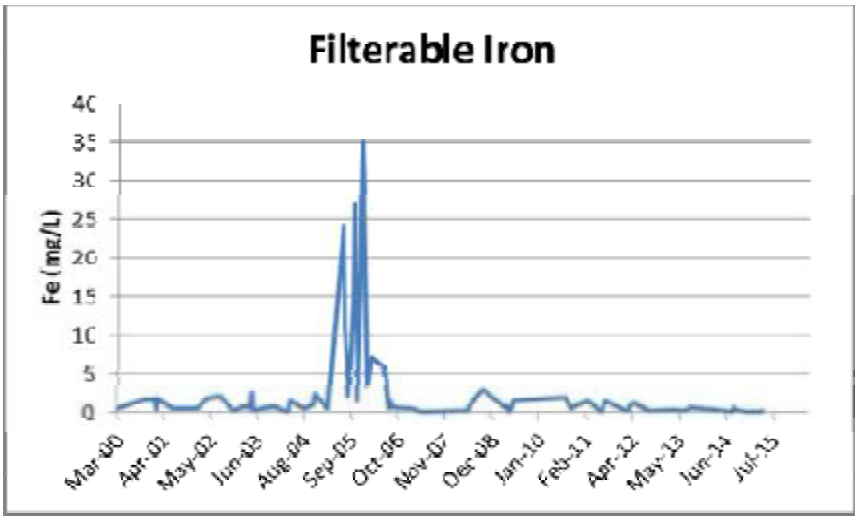


Dissolved oxygen results presentation

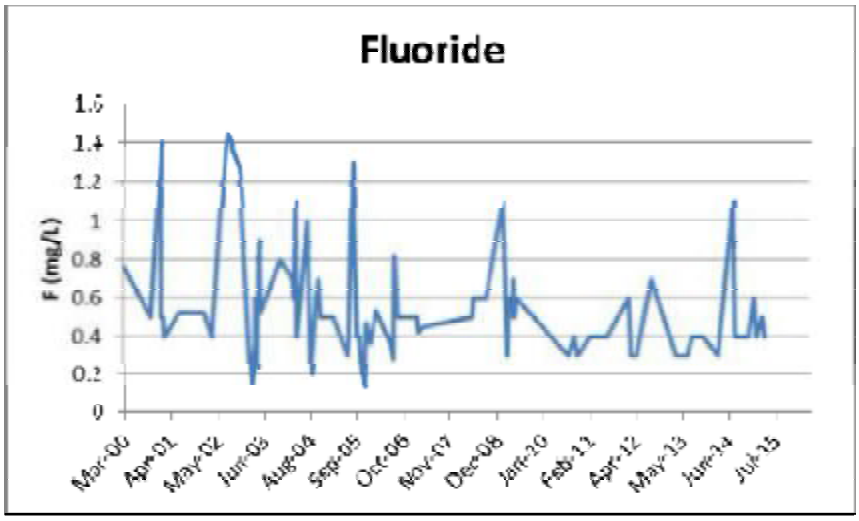


Conductivity is a measure of the waters ability to pass electrical current, usually though positively or negatively charged inorganic dissolved solids (e.g. sodium, magnesium, calcium, iron). The conductivity results for the stormwater detention pond have been stable and trending downwards. Dissolved oxygen levels can be depleted by biological activity associated with the nitrification process. The dissolved oxygen levels have been stable over the history of available results.

Filterable iron results presentation



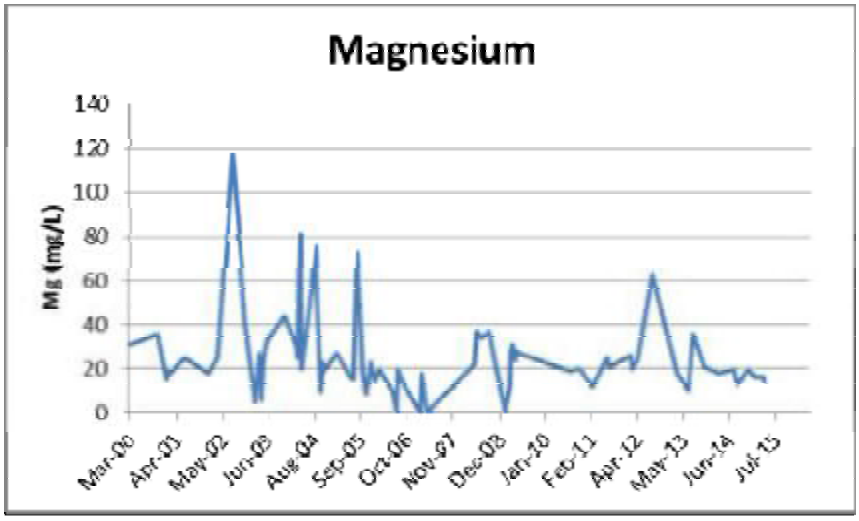
Fluoride results presentation



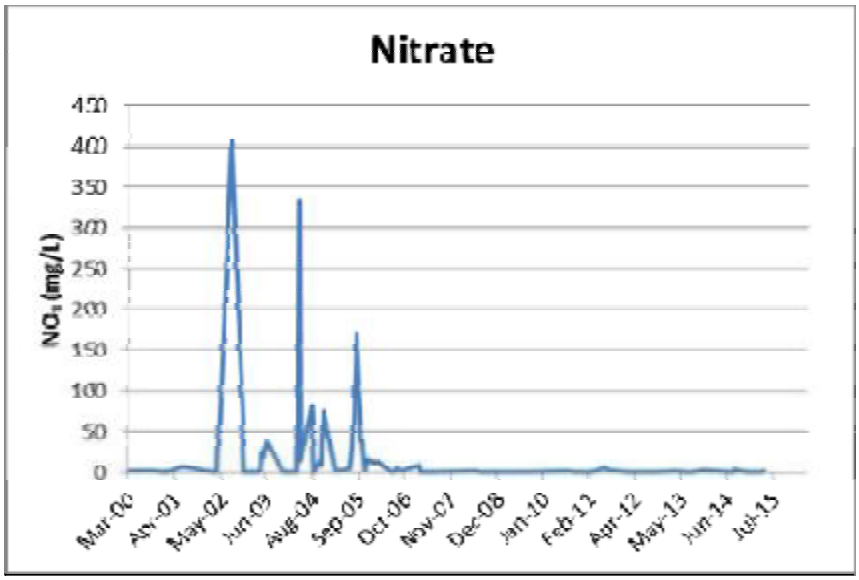
Filterable iron and fluoride have continued to trend at very low levels, especially with regard to the reporting period.

Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L. The level of fluoride found in the stormwater detention pond is therefore relatively low and displays a consistent trend over the twelve year sampling period.

Magnesium results presentation

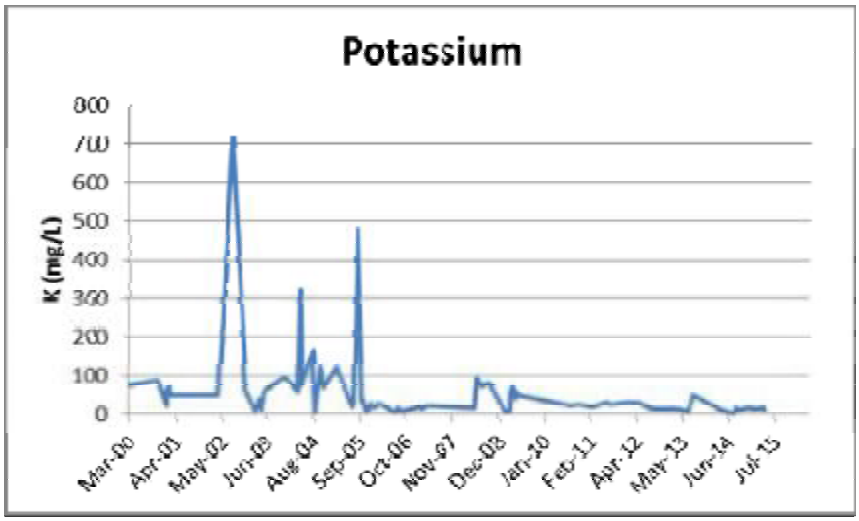


Nitrate results presentation

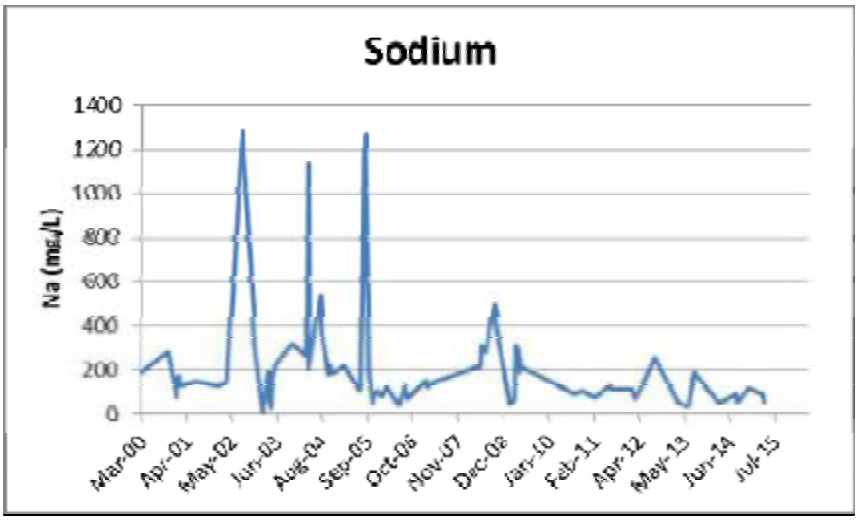


The *2011 Australian Drinking Water Guidelines 6* states that a maximum of 50 mg/L of nitrate is safe for consumption, whilst magnesium is considered as "soft" in the range of 0-60 mg/L. The relatively low levels of nitrate and magnesium sampled indicate that landfill leachate is probably not present in the stormwater detention pond.

Potassium results presentation

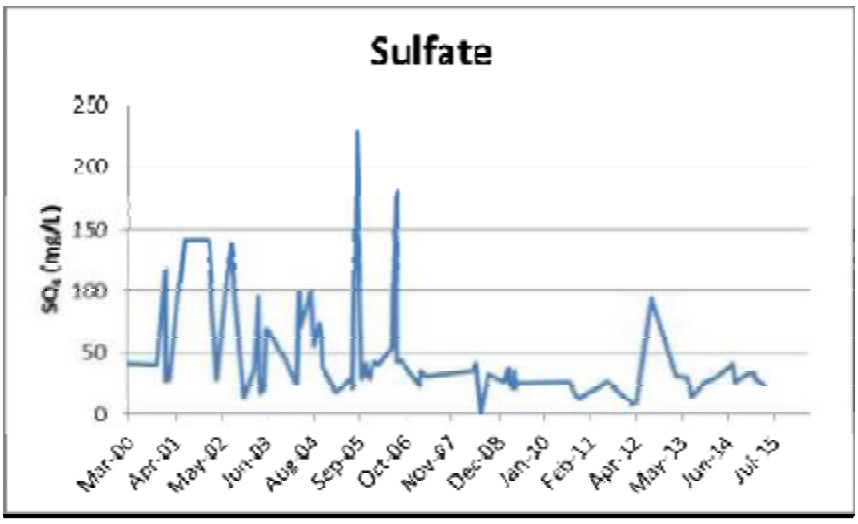


Sodium results presentation



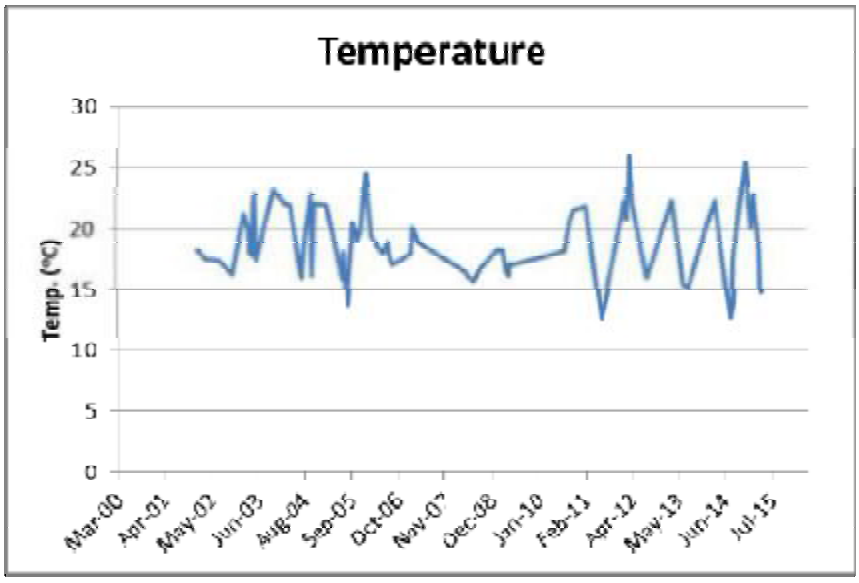
Potassium and sodium concentrations have been in line with recent trends and with the naturally occurring groundwater levels of these analytes around the site. Both analytes have trended downwards in recent years.

Sulfate results presentation



The *2011 Australian Drinking Water Guidelines 6* sets maximum sulfate levels in drinking water as 500 mg/L. The sulfate levels in the stormwater detention pond are in line with the historical levels and are better than the drinkable water standard. Inorganic ions such as sulfate provide a potential indicator of groundwater contamination by landfill leachate. A sudden increase in these ions can act as early warning system.

Temperature results presentation

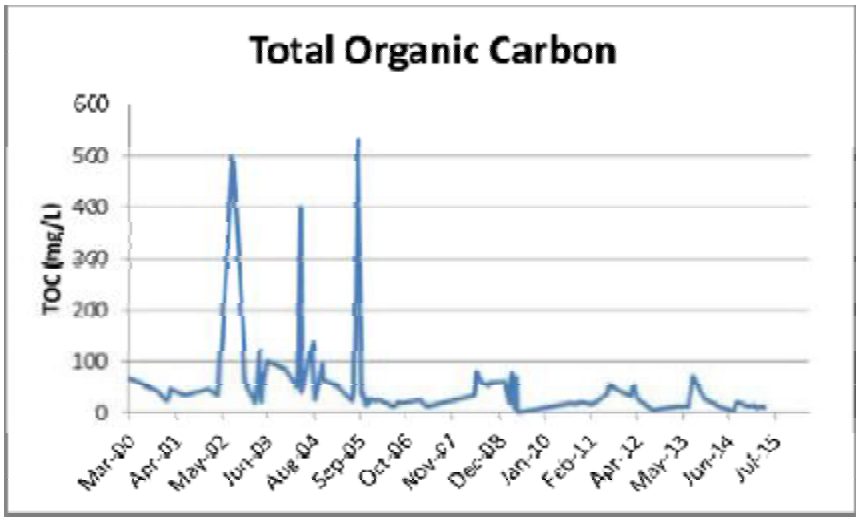


Temperature, as expected has generally been indicative of the season in which the stormwater detention pond has been sampled.

Total phenolics results presentation

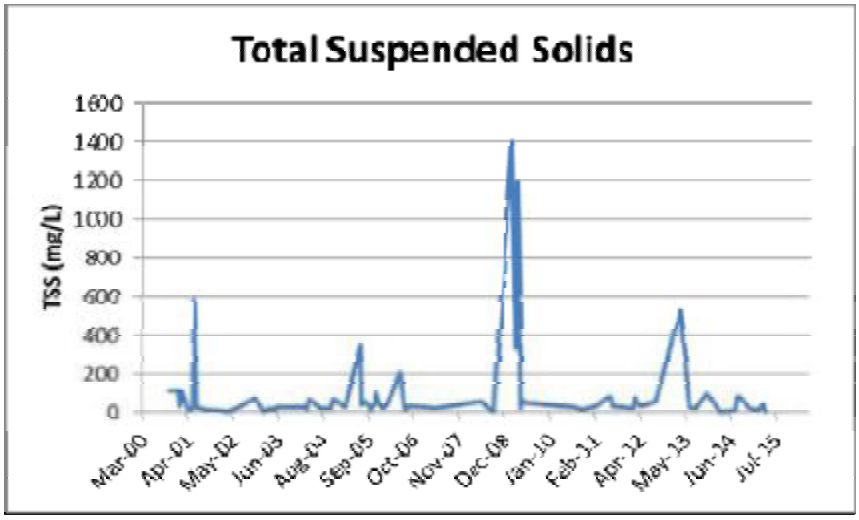
Total phenols are widely used in the manufacture of resins, plastics, insecticides, explosives, dyes, and detergents. It is also used as a raw material for the production of medicinal drugs such as aspirin. Historical results for total phenols have been extremely low and more often than not, below detectable limits in the stormwater detention pond. In fact, all samples taken during the reporting period were below detectable limits.

Total organic carbon results presentation

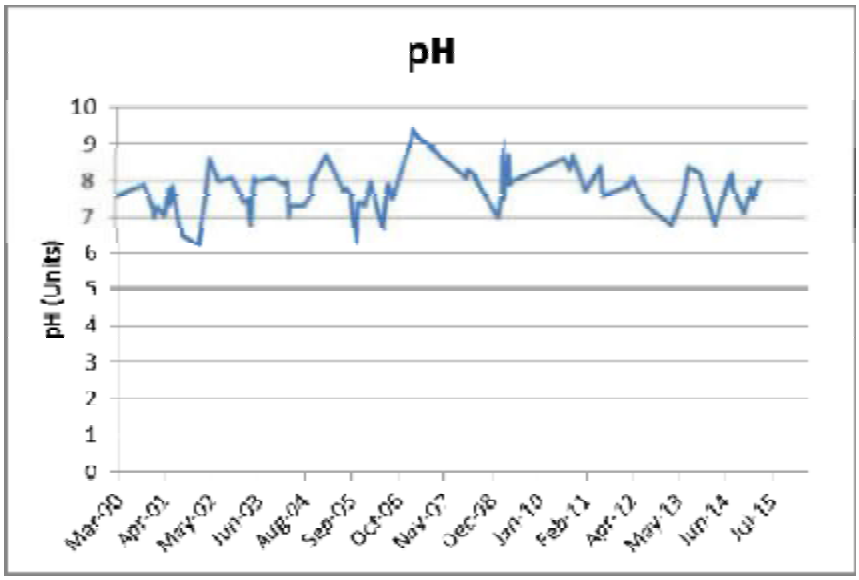


Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of water contamination by natural compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained consistently stable over the last ten years.

Total suspended solids results presentation



pH results presentation



The detention pond analytes measured at the site show relatively low levels of suspended solids and consistent pH levels in the surface water. The suspended solids levels were somewhat inconsistent in the 2008-2009 period, with the amount of solids suspended in the stormwater fluctuating. More

modern results indicate that the stormwater pond is functioning effectively with the exception of a peak in March 2013.

Surface Water Results Interpretation

From the analytical results it can be demonstrated that the sites sediment and stormwater pond infrastructure are performing adequately and as desired.

3.3 AIR EMISSIONS MONITORING

3.3.1 Tabulated Results

Table 3.3.1 Methane monitoring results for the reporting period

Date	Results Above Recommended Threshold 500ppm	Accumulation Above Recommended Threshold 1250ppm
Jun-14	0	0
Jul-14	0	0
Aug-14	0	0
Sep-14	0	0
Oct-14	0	0
Nov-14	0	0
Dec-14	0	0
Jan-15	0	0
Feb-15	0	0
Mar-15	0	0
Apr-15	0	0
May-15	0	0

Presented results are the number of individual sample results derived from monthly testing that are above the EPA Benchmark Technique recommended threshold levels for further action regarding surface emissions (500 ppm) and accumulation levels (1,250 ppm).

3.3.2 Data Presentation

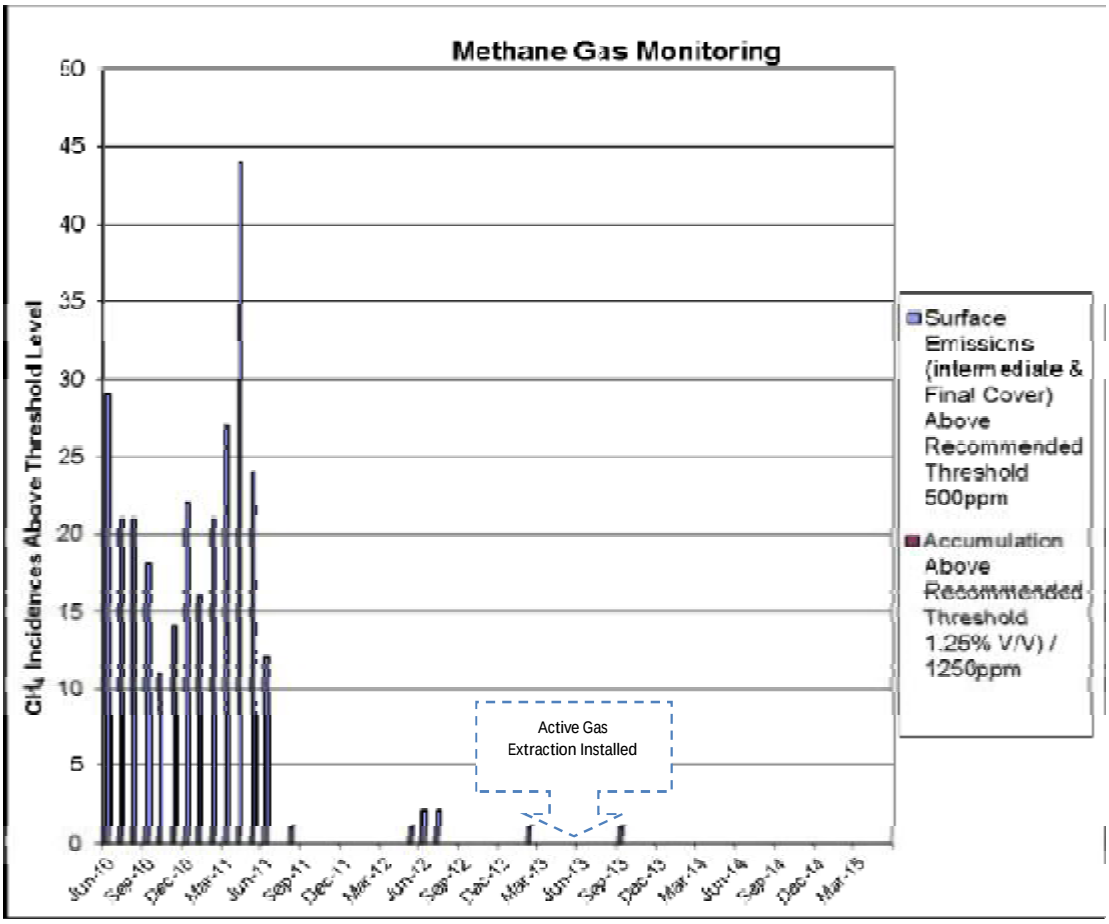


Figure 3.3.2 Air emissions test results above benchmark recommended threshold levels presentation

There is no evident trend for methane gas emissions from the landfill surface. No accumulation levels above the recommended benchmark threshold were found.

3.3.3 Air Emissions Monitoring Results Interpretation

During the period 2011-2012 results sampled by GHD showed continued occurrences of surface methane emissions above the EPA recommended threshold levels. A more recent contract awarded to a NATA approved laboratory (ALS Environmental) has shown that the GHD recorded levels were potentially overstated. Both companies state that the accumulation monitoring clearly shows that the methane is not migrating offsite.

Despite the differences in sample results, the site has the potential to generate relatively high amounts of landfill gas, namely methane that must be dealt with. Accordingly, Council commenced installation of methane gas extraction infrastructure. Phase 1 (covering the older western gully) of the landfill gas management is in place and connected to a flaring unit. Phase 2 (capturing the newer and current eastern gully) has been fully constructed and has been commissioned. The final Phase 3

gas collection system will include infrastructure within the waste filling of the new landfill cell at the WWARRP. Contract procurement is currently underway.

It should be noted that Council has not attempted to rehabilitate the areas prone to surface gas emissions as it would increase the possibility of those somewhat controlled emissions finding a new path of least resistance and becoming uncontrolled.

3.4 ENVIRONMENTAL COMPLAINTS

3.4.1 Tabulated Results

Year	Environmental Complaints
2000/2001	0
2001/2002	99
2002/2003	66
2003/2004	19
2004/2005	36
2005/2006	19
2006/2007	22
2007/2008	21
2008/2009	9
2009/2010	12
2010/2011	12
2011/2012	48
2012/2013	59
2013/2014	48
2014/2015	10

3.4.2 Data Presentation

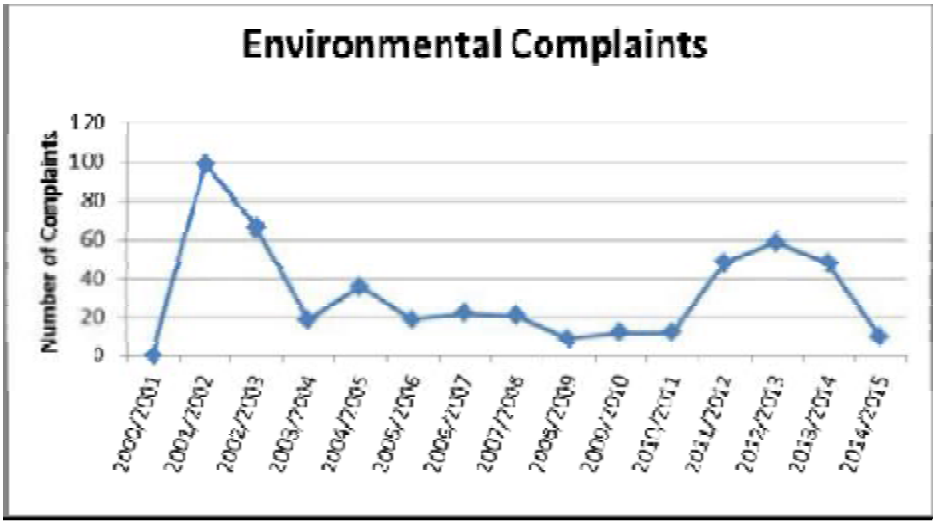


Figure 3.4.2 Environmental complaints results

Environmental complaints have generally trended downwards until the previous three reporting periods where a spike has occurred.

3.4.3 Environmental Complaints Results Interpretation

The overlying trend for environmental complaints had been downward after closure of the solid waste energy recovery facility in 2004. However, the previous three reporting periods have given rise to a spike of approximately 150 complaints, invariably regarding perceived odour from the WWARRP. It should be noted that Council commenced community engagement over a new landfill cell development at Whytes Gully coinciding with the 2011/12 year complaints spike.

For additional clarity of the potential causes in the spike of complaints over the previous reporting periods, Figure 3.4.3 is provided.

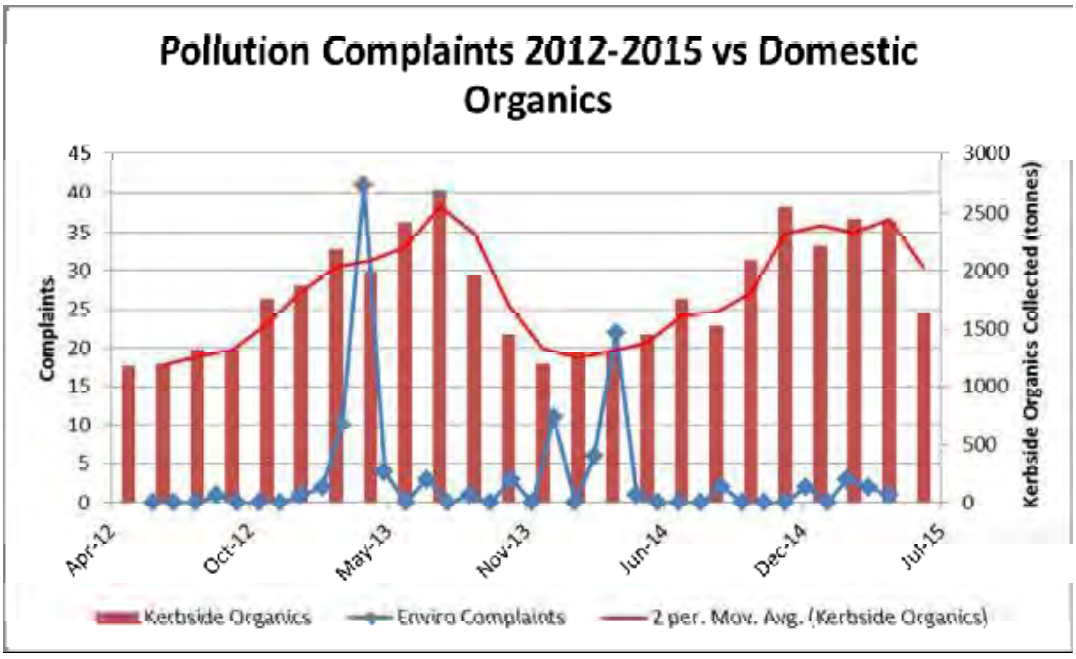


Figure 3.4.3, Pollution Complaints (Odour) vs Domestic Organic Waste Production

As detailed by a blue line in the Figure 3.4.3 (over a two year period), the majority of complaints have been received during late summer and into the autumn season.

The chart also demonstrates in red columns the tonnage of organic waste collected by Wollongong City Council in the kerbside collections. The red line above the columns indicates a non-linear fitted trend curve.

It can be noted from Figure 3.4.3 that complaints align almost perfectly with the increase trend for kerbside organic waste collected. It is also worthy of noting that the green waste is not received at the WWARRP and is instead received at a nearby site also located on Reddalls Road at Kembla Grange.

4 SITE SUMMATION

4.1 DEFICIENCY IDENTIFICATION & REMEDIATION

4.1.1 Surface Methane Emissions above Recommended Benchmark Threshold Levels

As discussed in Section 3.3.3, the site has historically possessed some previously landfilled areas that emit methane gas above the EPA's recommended benchmark level for further investigation into surface gas emissions. Council has not attempted to cap these areas so that the peak emissions locations are identified and so that the possibility of offsite migration is nullified. Council has trialled a biofiltration type system to attempt to reduce the methane emissions from identified peak areas. However, in February 2013 Council commenced installation of a gas extraction system. The gas management system and its future developments are expected to continue to address the gas emission issues that have historically arisen from time to time at the WWARRP. In conjunction with the gas extraction system, additional subsurface sampling points have been recently installed. These points are now included in sampling regimes.

4.1.2 Boreholes Indicating Potentially Imperfect Trend Stability

As discussed in Section 3.1.4, borehole 16 has provided individual and incidental analytical results that require a continued level of scrutiny upon future measurements to ensure negative trends are not establishing. Whilst it is common for individual analytical results to vary from time to time, the prudent course of action is to provide an increased level of vigilance for these analyte and borehole combinations until such time the results return to historic levels or further action is required.

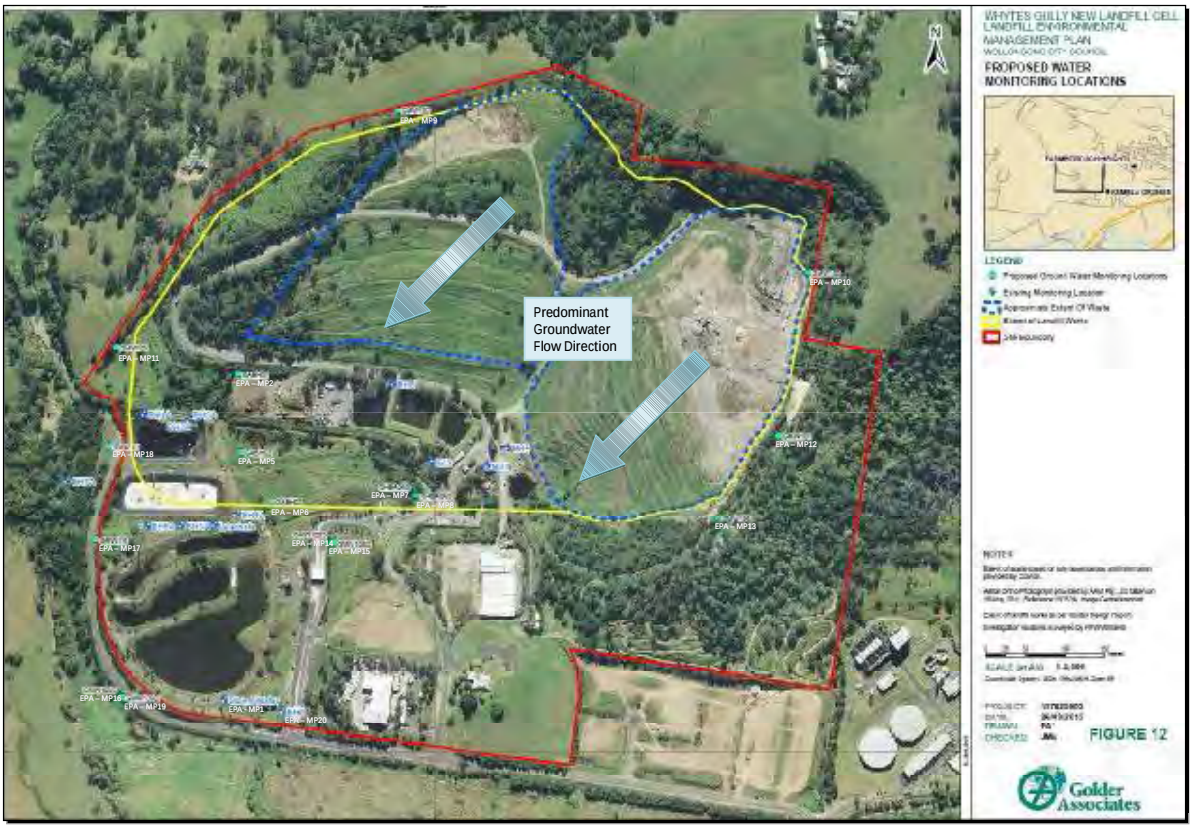
4.2 CONCLUSION

The site is performing well within the individual criteria and limits assigned to it in regard to environmental performance. The low number of deficiencies and nil non compliances shows that Council has maintained satisfactory environmental performance. Actions have already commenced to improve the sites performance in regard to the identified deficiency in Section 4.1.1, which will ensure Council's goal of continuous environmental improvement at Whytes Gully is achieved.

Further, modernised test regimes already implemented, along with the completion of the new cell development will provide a far better reflection of the state of the environment affected by the site. Consequently, environmental performance trend analysis and analytical results will be more pertinent as the new cell develops, however, observations made in this years annual return indicate that there has already been some stabilisation/improvement observed in the sites environmental performance.

Annexure A

Environmental Monitoring Locations


Predominant
Groundwater
Flow Direction
WHYTES GULLY NEW LANDFILL CELL
LANDFILL ENVIRONMENTAL
MANAGEMENT PLAN
PROPOSED WATER
MONITORING LOCATIONS
LEGEND
FIGURE 12
Golder
Associates

Annual Return 2014 - 2015

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

ANNUAL RETURN

LICENCE NO	**5862**
LICENCE HOLDER	WOLLONGONG CITY COUNCIL
REPORTING PERIOD	29-May-2014 to 28-May-2015

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual Return relates below:

REVISED REPORTING PERIOD ____ / ____ / ____ **to** ____ / ____ / ____

(Note: the revised reporting period also needs to be entered in Section E)

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 28-Jul-2015

Your Annual Return must be completed, including certification in Section E, and submitted to the EPA no later than 60 Days after the end of the reporting period for your licence.

Failure to submit this Annual Return within 60 days after the reporting period ends may result in:

- **the issue of a Penalty Notice for $1500 (individuals) or $3000 (corporations);**

OR

- **prosecution.**

Please send your completed Annual Return by **Registered Post** to

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

THERE IS A MAXIMUM PENALTY OF $250,000 FOR A CORPORATION OR $120,000 FOR AN INDIVIDUAL.

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997*

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

Use the checklist below to ensure that you have completed your Annual Return correctly.

(✓ the boxes)

	CHECKLIST	
☑	Section A:	All licence details are correct
☑	Section B1:	You have entered the correct number in the complaints table
☑	Section B2 – B3:	If there are tables, you have provided the required details
☑	Section C:	You have answered question 1, and 2 if applicable
☑	Section D:	If applicable, you have completed all load calculation worksheets
☑	Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☑	Section F:	You have answered question 1, 2 and 3 if applicable
☑	Section G:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
☑	Make a copy of the completed Annual Return and keep it with your licence records	
☑	Attach a cheque (unless you have paid separately) for the payment of the administrative fee for the next licence fee period EFT	

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

Annual Return

WOLLONGONG CITY COUNCIL

NSW EPA

A Statement of Compliance - Licence Details

ALL licence holders must check that the licence details in Section A are correct

If there are changes to any of these details you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.

Licence variation and transfer application forms are available on the EPA website at: http://www.epa.nsw.gov.au/licensing, or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700.

If you are applying to vary or transfer your licence you must still complete this Annual Return.

A1 Licence Holder

Licence Number	5862
Licence Holder	WOLLONGONG CITY COUNCIL
Trading Name *(if applicable)*	
ABN	63 139 525 939

A2 Premises to which Licence Applies (if applicable)

Common Name (if any)	WHYTES GULLY WASTE DISPOSAL FACILITY
Premises	REDDALLS ROAD KEMBLA GRANGE NSW 2526

A3 Activities to which Licence Applies

Waste Disposal (application to land)

A4 Other Activities (if applicable)

A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Waste disposal by application to land		annual capacity

A6 Assessable Pollutants (Not Applicable)

B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

Number of complaints recorded by the licensee during the reporting period. **If no complaints were received enter nil in the attached box, otherwise complete the table below.**	0

Pollution Complaint Category	Number of Complaints
Air	10
Water	\
Noise	\
Waste	\
Other	\

B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is **not** required by your licence, **no tables** will appear below.
Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Discharge & Monitoring Point 1

Stormwater monitoring and discharge point, Outlet at Reddalls Road - Monitoring point labelled 1 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297777 N6183972

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	1	8	126	175.25	229

Ammonia	milligrams per litre	1	8	0.07	0.78	2.74
Calcium	milligrams per litre	1	8	22	27.5	35
Chloride	milligrams per litre	1	8	50	86	127
Conductivity	microsiemens per centimetre	1	8	504	680.13	845
Dissolved Oxygen	milligrams per litre	1	8	6.14	8.14	9.78
Filterable iron	milligrams per litre	1	8	0.05	0.204	0.61
Fluoride	milligrams per litre	1	8	0.4	0.53	1.1
Magnesium	milligrams per litre	1	8	13	16.13	20
Nitrate	milligrams per litre	1	8	0.11	1.604	4.37
pH	pH	1	8	7.1	7.81	8.2
Potassium	milligrams per litre	1	8	2	11.63	16
Sodium	milligrams per litre	1	8	53	86.25	118
Sulfate	milligrams per litre	1	8	24	29.63	41
Temperature	degrees Celsius	1	8	12.8	18.25	25.5
Total organic carbon	milligrams per litre	1	8	4	13.63	21
Total Phenolics	milligrams per litre	1	8	0.05	0.05	0.05

Total suspended solids	milligrams per litre	1	8	5	33-63	88

Monitoring Point 2

Groundwater quality monitoring, Monitoring point labelled GABH01 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297751.8 N6184474

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4				
Aluminium	milligrams per litre	1				
Arsenic	milligrams per litre	1				
Barium	milligrams per litre	1				
Benzene	milligrams per litre	1				
Cadmium	milligrams per litre	1				
Calcium	milligrams per litre	4				
Chloride	milligrams per litre	4				
Chromium (hexavalent)	milligrams per litre	1				
Chromium (total)	milligrams per litre	1				
Cobalt	milligrams per litre	1				
Conductivity	microsiemens per centimetre	4				

DESTROYED

Copper	milligrams per litre	1				
Ethyl benzene	micrograms per litre	1				
Fluoride	milligrams per litre	1				
Lead	milligrams per litre	1				
Magnesium	milligrams per litre	4				
Manganese	micrograms per litre	1				
Mercury	milligrams per litre	1				
Nitrate	milligrams per litre	1				
Nitrite	milligrams per litre	1				
Nitrogen (ammonia)	milligrams per litre	4				
Organochlorine pesticides	milligrams per litre	1				
Organophosphate pesticides	milligrams per litre	1				
pH	pH	4				
Polycyclic aromatic hydrocarbons	milligrams per litre	1				
Potassium	milligrams per litre	4				
Sodium	milligrams per litre	4				

DESTROYED

Standing Water Level	metres	4				
Sulfate	milligrams per litre	4				
Toluene	milligrams per litre	1				/
Total dissolved solids	milligrams per litre	4				
Total organic carbon	milligrams per litre	4				
Total Phenolics	milligrams per litre	1	/ DESTROYED			
TPH	milligrams per litre	1				
Xylene	milligrams per litre	1				
Zinc	milligrams per kilogram	1				

Monitoring Point 3

Surface gas monitoring, Areas where intermediate or final cover has been placed.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	12	0	0·00819	0·6384

Monitoring Point 4

Gas accumulation monitoring, Inside all buildings within 250 metres of deposited waste.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	12	12	0	0.000233	0.00263

Monitoring Point 5

Groundwater quality monitoring, Monitoring point labelled GABH02 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297754.9 N6184377

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	987	1064-25	1120
Aluminium	milligrams per litre	1	1	1·7	1·7	1·7
Arsenic	milligrams per litre	1	1	<0·001	<0·001	<0·001
Barium	milligrams per litre	1	1	0·006	0·006	0·006
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0·0001	<0·0001	<0·0001
Calcium	milligrams per litre	4	4	295	323-25	349
Chloride	milligrams per litre	4	4	1070	1182-5	1260
Chromium (hexavalent)	milligrams per litre	1	1	<0·01	<0·01	<0·01
Chromium (total)	milligrams per litre	1	1	0·001	0·001	0·001
Cobalt	milligrams per litre	1	1	<0·001	<0·001	<0·001
Conductivity	microsiemens per centimetre	4	4	5220	5310	5440

Copper	milligrams per litre	1	1	0·003	0·003	0·003
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0·5	0·5	0·5
Lead	milligrams per litre	1	1	0·001	0·001	0·001
Magnesium	milligrams per litre	4	4	194	200-75	212
Manganese	micrograms per litre	1	1	0·045	0·045	0·045
Mercury	milligrams per litre	1	1	<0·0001	<0·0001	<0·0001
Nitrate	milligrams per litre	1	1	<0-01	<0-01	<0-01
Nitrite	milligrams per litre	1	1	<0-01	<0·01	<0-01
Nitrogen (ammonia)	milligrams per litre	4	4	0-01	0·02	0-03
Organochlorine pesticides	milligrams per litre	1	1	<0-5	<0·5	<0·5
Organophosphate pesticides	milligrams per litre	1	1	<0-5	<0-5	<0-5
pH	pH	4	4	6·6	6·63	6·7
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	3	3	3
Sodium	milligrams per litre	4	4	602	661-5	744

Standing Water Level	metres	4	4	4-77	4-98	5-12
Sulfate	milligrams per litre	4	4	165	175	187
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	2900	3030	3220
Total organic carbon	milligrams per litre	4	4	1	5	7
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0.011	0.011	0.011

Monitoring Point 6

Groundwater quality monitoring, Monitoring point labelled GABH03 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E287793.8 N6184315

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	617	712	761
Aluminium	milligrams per litre	1	1	0-19	0-19	0-19
Arsenic	milligrams per litre	1	1	<0.001	<0-001	<0-001
Barium	milligrams per litre	1	1	0-015	0-015	0-015

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	337	367.75	400
Chloride	milligrams per litre	4	4	1200	1320	1390
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	microsiemens per centimetre	4	4	5290	5400	5490
Copper	milligrams per litre	1	1	0.003	0.003	0.003
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	208	213.75	222
Manganese	micrograms per litre	1	1	0.302	0.302	0.302
Mercury	milligrams per litre	1	1	0.0001	0.0001	0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0·01	<0·01	<0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·01	0·02	0·03
Organochlorine pesticides	milligrams per litre	1	1	<0·05	<0·05	<0·05
Organophosphate pesticides	milligrams per litre	1	1	<0·05	<0·05	<0·05
pH	pH	4	4	6·6	6·68	6·9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	2	2	2
Sodium	milligrams per litre	4	4	496	540	614
Standing Water Level	metres	4	4	0·49	0·59	0·65
Sulfate	milligrams per litre	4	4	172	200·5	222
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	3130	3337·5	3540
Total organic carbon	milligrams per litre	4	4	1	3·75	5
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.008	0.008	0.008

Monitoring Point 7

Groundwater quality monitoring, Monitoring point labelled GABH06D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297975.6 N6184322

Pollutant →	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	327	355.25	376
Aluminium	milligrams per litre	1	1	0.08	0.08	0.08
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.005	0.005	0.005
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	94	106	117
Chloride	milligrams per litre	4	4	559	653.75	708
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	microsiemens per centimetre	4	4	2830	2880	2960

Copper	milligrams per litre	1	1	0.003	0.003	0.003
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	61	64.75	69
Manganese	micrograms per litre	1	1	0.006	0.006	0.006
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.03	0.05
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.6	6.95	7.3
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	391	445.5	497

Standing Water Level	metres	4	4	1·7	1·88	2·02
Sulfate	milligrams per litre	4	4	171	195·75	225
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1400	1590	1710
Total organic carbon	milligrams per litre	4	4	1	1	1
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	2	2	2
Zinc	milligrams per kilogram	1	1	0 005	0 005	0·005

Monitoring Point 8

Groundwater quality monitoring, Monitoring point labelled GABH06S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E257977 N6184322

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	398	433·5	454
Aluminium	milligrams per litre	1	1	0·12	0·12	0·12
Arsenic	milligrams per litre	1	1	<0·001	<0·001	<0·001
Barium	milligrams per litre	1	1	0·09	0·09	0·09

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	1	77	77	77
Chloride	milligrams per litre	4	4	227	539-75	698
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	2990	3082-5	3140
Copper	milligrams per litre	1	1	0.006	0.006	0.006
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.9	0.9	0.9
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	75	75	75
Manganese	micrograms per litre	1	1	0.057	0.057	0.057
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.07	0.07	0.07

Nitrite	milligrams per litre	1	1	<0·01	<0·01	<0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·01	0·015	0·02
Organochlorine pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
Organophosphate pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
pH	pH	4	4	6-9	7-13	7-4
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	452	505·5	569
Standing Water Level	metres	4	4	2-2	2-37	2-5
Sulfate	milligrams per litre	4	4	218	227-75	246
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1600	1680	1770
Total organic carbon	milligrams per litre	4	4	1	1-25	2
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.009	0.009	0.009

Monitoring Point 9

Groundwater quality monitoring, Monitoring point labelled GMW102 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297952.6 N6184807

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	84	190.67	278
Aluminium	milligrams per litre	1	1	8.087	8.087	8.087
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.043	0.043	0.043
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	10	43.67	62
Chloride	milligrams per litre	4	4	14	16.33	19
Chromium (hexavalent)	milligrams per litre	1	1	<0.1	<0.1	<0.1
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	microsiemens per centimetre	4	4	245	446.33	578

Copper	milligrams per litre	1	1	0.012	0.012	0.012
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.2	0.2	0.2
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	4	12.67	20
Manganese	micrograms per litre	1	1	0.059	0.059	0.059
Mercury	milligrams per litre	1	1	0.0001	0.0001	0.0001
Nitrate	milligrams per litre	1	1	0.33	0.33	0.33
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.02	0.03	0.04
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6	6.77	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	27	32.67	37

Standing Water Level	metres	4	4	4·55	8·95	11·7
Sulfate	milligrams per litre	4	4	13	16·67	24
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	296	334	406
Total organic carbon	milligrams per litre	4	4	1	3·33	7
Total Phenolics	milligrams per litre	1	1	0·05	0·05	0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0·021	0·021	0·021

Monitoring Point 10

Groundwater quality monitoring, Monitoring point labelled GMW103 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470.2 N6184603

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	389	422·75	440
Aluminium	milligrams per litre	1	1	0·06	0·06	0·06
Arsenic	milligrams per litre	1	1	<0·001	<0·001	<0·001
Barium	milligrams per litre	1	1	0·015	0·015	0·015

Benzene	milligrams per litre	1	1	<2	<2	<2
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	156	186.75	234
Chloride	milligrams per litre	4	4	320	409.5	553
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	240	1802.5	2530
Copper	milligrams per litre	1	1	0.002	0.002	0.002
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	60	66.5	75
Manganese	micrograms per litre	1	1	0.28	0.28	0.28
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0·01	<0·01	<0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·02	0·04	0·05
Organochlorine pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
Organophosphate pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
pH	pH	4	4	6·8	6·95	7·1
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	160	182	214
Standing Water Level	metres	4	4	7·25	7·47	7·73
Sulfate	milligrams per litre	4	4	122	133·25	155
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	988	1224·5	1620
Total organic carbon	milligrams per litre	4	4	1	1·75	2
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.008	0.008	0.008

Monitoring Point 11

Groundwater quality monitoring, Monitoring point labelled GMW104 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297597.9 N6184508

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	145	199-5	284
Aluminium	milligrams per litre	1	1	0.07	0.07	0.07
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.002	0.002	0.002
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	20	27	40
Chloride	milligrams per litre	4	4	34	42-25	53
Chromium (hexavalent)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	520	679-5	1090

Copper	milligrams per litre	1	1	0.001	0.001	0.001
Ethyl benzene	micrograms per litre	1	1	0.001	0.001	0.001
Fluoride	milligrams per litre	1	1	0.7	0.7	0.7
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	14	17.75	22
Manganese	micrograms per litre	1	1	0.019	0.019	0.019
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.02	0.02	0.02
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.04	0.06
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.7	7.03	7.2
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	48	63.75	84

Standing Water Level	metres	4	4	6-95	7-31	7-49
Sulfate	milligrams per litre	4	4	30	33-75	42
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	260	323-5	455
Total organic carbon	milligrams per litre	4	4	1	1-75	2
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0·01	0·01	0·01

Monitoring Point 12

Groundwater quality monitoring, Monitoring point labelled GMW105 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298433.3 N6184397

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	17	33	44
Aluminium	milligrams per litre	1	1	0·34	0·34	0·34
Arsenic	milligrams per litre	1	1	<0·001	<0·001	<0·001
Barium	milligrams per litre	1	1	<0·001	<0·001	<0·001

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	4	5.5	7
Chloride	milligrams per litre	4	4	29	41.25	58
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	243	264.75	283
Copper	milligrams per litre	1	1	<0.001	<0.001	<0.001
Ethyl benzene	micrograms per litre	1	1	2	2	2
Fluoride	milligrams per litre	1	1	0.3	0.3	0.3
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	2	3	4
Manganese	micrograms per litre	1	1	0.007	0.007	0.007
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	4.82	4.82	4.82

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.05	0.14
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	5.4	5.63	5.8
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	35	38.75	42
Standing Water Level	metres	4	4	7.46	9.88	11
Sulfate	milligrams per litre	4	4	12	13.75	15
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	192	206	221
Total organic carbon	milligrams per litre	4	4	1	1.75	4
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	<0.005	<0.005	<0.005

Monitoring Point 13

Groundwater quality monitoring, Monitoring point labelled GMW106 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298356.8 N6184294

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre					
Aluminium	milligrams per litre					
Arsenic	milligrams per litre					
Barium	milligrams per litre					
Benzene	milligrams per litre					
Cadmium	milligrams per litre					
Calcium	milligrams per litre					
Chloride	milligrams per litre					
Chromium (hexavalent)	milligrams per litre					
Chromium (total)	milligrams per litre					
Cobalt	milligrams per litre					
Conductivity	microsiemens per centimetre					

Copper	milligrams per litre					
Ethyl benzene	micrograms per litre					
Fluoride	milligrams per litre					
Lead	milligrams per litre					
Magnesium	milligrams per litre					
Manganese	micrograms per litre					
Mercury	milligrams per litre					
Nitrate	milligrams per litre					
Nitrite	milligrams per litre					
Nitrogen (ammonia)	milligrams per litre					
Organochlorine pesticides	milligrams per litre					
Organophosphate pesticides	milligrams per litre					
pH	pH					
Polycyclic aromatic hydrocarbons	milligrams per litre					
Potassium	milligrams per litre					
Sodium	milligrams per litre					

Standing Water Level	metres					
Sulfate	milligrams per litre					
Toluene	milligrams per litre					
Total dissolved solids	milligrams per litre					
Total organic carbon	milligrams per litre					
Total Phenolics	milligrams per litre					
TPH	milligrams per litre					
Xylene	milligrams per litre					
Zinc	milligrams per kilogram					

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Monitoring Point 14

Groundwater quality monitoring, Monitoring point labelled GMW108S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297870.2 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	183	450.75	614
Aluminium	milligrams per litre	1	1	0.52	0.52	0.52
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.051	0.051	0.051

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	25	83.5	136
Chloride	milligrams per litre	4	4	36	401-75	753
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.002	0.002	0.002
Cobalt	milligrams per litre	1	1	0.002	0.002	0.002
Conductivity	microsiemens per centimetre	4	4	508	2247	3670
Copper	milligrams per litre	1	1	<0.001	<0.001	<0.001
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.7	0.7	0.7
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	11	62	116
Manganese	micrograms per litre	1	1	0.125	0.125	0.125
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0·01	<0·01	<0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·02	0·025	0·04
Organochlorine pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
Organophosphate pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
pH	pH	4	4	6·6	7·43	9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	2	3
Sodium	milligrams per litre	4	4	53	314·25	554
Standing Water Level	metres	4	4	2·52	2·62	2·73
Sulfate	milligrams per litre	4	4	18	123·75	220
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	320	1208	1940
Total organic carbon	milligrams per litre	4	4	1	5·45	11
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	<0.005	<0.005	<0.005

Monitoring Point 15

Groundwater quality monitoring, Monitoring point labelled GMW108D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E287871.4 N6184262

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	429	467-5	505
Aluminium	milligrams per litre	1	1	0.03	0.03	0.03
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.012	0.012	0.012
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	-0.0001	-0.0001
Calcium	milligrams per litre	4	4	114	129-75	153
Chloride	milligrams per litre	4	4	615	654-25	710
Chromium (hexavalent)	milligrams per litre	1	1	0.01	0.01	0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	3030	3112-5	3200

Copper	milligrams per litre	1	1	0.002	0.002	0.002
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.7	0.7	0.7
Lead	milligrams per litre	1	1	0.001	0.001	0.001
Magnesium	milligrams per litre	4	4	87	91.33	100
Manganese	micrograms per litre	1	1	0.003	0.003	0.003
Mercury	milligrams per litre	1	1	0.0001	0.0001	0.0001
Nitrate	milligrams per litre	1	1	0.01	0.01	0.01
Nitrite	milligrams per litre	1	1	0.01	0.01	0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.012	0.02
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.7	6.95	7.4
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1.5	3
Sodium	milligrams per litre	4	4	401	445.25	524

Standing Water Level	metres	4	4	2.02	2.17	2.26
Sulfate	milligrams per litre	4	4	192	205.5	223
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1630	1725	1810
Total organic carbon	milligrams per litre	4	4	1	1.5	2
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0.006	0.006	0.006

Monitoring Point 16

Groundwater quality monitoring, Monitoring point labelled GMW109S on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297605.7 N6184068

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	239	379	503
Aluminium	milligrams per litre	1	1	2.31	2.31	2.31
Arsenic	milligrams per litre	1	1	0.003	0.003	0.003
Barium	milligrams per litre	1	1	0.263	0.263	0.263

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	0.0002	0.0002	0.0002
Calcium	milligrams per litre	4	4	77	126.5	216
Chloride	milligrams per litre	4	4	228	243.5	256
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	0.003	0.003	0.003
Cobalt	milligrams per litre	1	1	0.024	0.024	0.024
Conductivity	microsiemens per centimetre	4	4	1380	1670	2140
Copper	milligrams per litre	1	1	0.022	0.022	0.022
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.2	0.2	0.2
Lead	milligrams per litre	1	1	0.007	0.007	0.007
Magnesium	milligrams per litre	4	4	37	47.5	66
Manganese	micrograms per litre	1	1	4.38	4.38	4.38
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.06	0.06	0.06

Nitrite	milligrams per litre	1	1	0·01	0·01	0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·54	1·07	1·69
Organochlorine pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
Organophosphate pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
pH	pH	4	4	6·3	6·375	6·5
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	2	3·5	5
Sodium	milligrams per litre	4	4	158	181·25	202
Standing Water Level	metres	4	4	2·7	3·07	3·5
Sulfate	milligrams per litre	4	4	93	173·75	398
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	686	951	1430
Total organic carbon	milligrams per litre	4	4	1	4·5	8
Total Phenolics	milligrams per litre	1	1	<0·05	<0·05	<0·05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.109	0.109	0.109

Monitoring Point 17

Groundwater quality monitoring, Monitoring point labelled GMW110 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297572.6 N6184266

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	566	605.75	634
Aluminium	milligrams per litre	1	1	0.81	0.81	0.81
Arsenic	milligrams per litre	1	1	0.001	0.001	0.001
Barium	milligrams per litre	1	1	0.005	0.005	0.005
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	177	203.75	220
Chloride	milligrams per litre	4	4	816	879	923
Chromium (hexavalent)	milligrams per litre	1	1	177	177	177
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	3910	4025	4100

Copper	milligrams per litre	1	1	0.004	0.004	0.004
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	153	160.5	170
Manganese	micrograms per litre	1	1	0.093	0.093	0.093
Mercury	milligrams per litre	1	1	0.0001	0.0001	0.0001
Nitrate	milligrams per litre	1	1	0.11	0.11	0.11
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.013	0.02
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.6	6.7	6.8
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1.75	2
Sodium	milligrams per litre	4	4	459	513.25	580

Standing Water Level	metres	4	4	3.93	4.03	4.15
Sulfate	milligrams per litre	4	4	278	304.25	326
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	2160	2317.5	2430
Total organic carbon	milligrams per litre	4	4	1	2.25	5
Total Phenolics	milligrams per litre	1	1	<0.05	<0.05	<0.05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<1	<1	<1
Zinc	milligrams per kilogram	1	1	0.015	0.015	0.015

Monitoring Point 18

Groundwater quality monitoring, Monitoring point labelled GMW111 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297588.6 N6184385

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	111	374	480
Aluminium	milligrams per litre	1	1	0.26	0.26	0.26
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.016	0.016	0.016

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	72	91-5	101
Chloride	milligrams per litre	4	4	472	499.75	531
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	<0.001	<0.001	<0.001
Conductivity	microsiemens per centimetre	4	4	1300	2167-5	2560
Copper	milligrams per litre	1	1	0.012	0.012	0.012
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.5	0.5	0.5
Lead	milligrams per litre	1	1	<0.001	<0.001	<0.001
Magnesium	milligrams per litre	4	4	66	72-75	80
Manganese	micrograms per litre	1	1	0.077	0.077	0.077
Mercury	milligrams per litre	1	1	0.0001	0.0001	0.0001
Nitrate	milligrams per litre	1	1	<0.01	<0.01	<0.01

Nitrite	milligrams per litre	1	1	<0·01	<0·01	<0·01
Nitrogen (ammonia)	milligrams per litre	4	4	0·01	0·018	0·02
Organochlorine pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
Organophosphate pesticides	milligrams per litre	1	1	<0·5	<0·5	<0·5
pH	pH	4	4	6·8	6·98	7·1
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	338	374·25	412
Standing Water Level	metres	4	4	6·08	6·2	6·36
Sulfate	milligrams per litre	4	4	96	108·75	116
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	1220	1302·5	1350
Total organic carbon	milligrams per litre	4	4	1	1·25	2
Total Phenolics	milligrams per litre	1	1	0·05	0·05	0.05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	6-8	6-8	6-8

Monitoring Point 19

Groundwater quality monitoring, Monitoring point labelled GMW109D on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297604.9 N6184088

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	218	238	248
Aluminium	milligrams per litre	1	1	0.29	0.29	0.29
Arsenic	milligrams per litre	1	1	<0.001	<0.001	<0.001
Barium	milligrams per litre	1	1	0.144	0.144	0.144
Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	0.0002	0.0002	0.0002
Calcium	milligrams per litre	4	4	79	89	104
Chloride	milligrams per litre	4	4	388	404-25	424
Chromium (hexavalent)	milligrams per litre	1	1	0.01	0.01	0.01
Chromium (total)	milligrams per litre	1	1	0.001	0.001	0.001
Cobalt	milligrams per litre	1	1	0.001	0.001	0.001
Conductivity	microsiemens per centimetre	4	4	1640	1685	1750

Copper	milligrams per litre	1	1	0.016	0-016	0.016
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.4	0.4	0.4
Lead	milligrams per litre	1	1	0.004	0.004	0.004
Magnesium	milligrams per litre	4	4	45	47-25	52
Manganese	micrograms per litre	1	1	0.526	0.526	0.526
Mercury	milligrams per litre	1	1	0.0001	0.0001	0.0001
Nitrate	milligrams per litre	1	1	0.3	0.3	0.3
Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.01	0.048	0.13
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.8	7.18	7.4
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1.75	2
Sodium	milligrams per litre	4	4	187	199.25	228

Standing Water Level	metres	4	4	2-58	2-78	3.07
Sulfate	milligrams per litre	4	4	25	121.25	407
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	834	926-5	1000
Total organic carbon	milligrams per litre	4	4	1	1	1
Total Phenolics	milligrams per litre	1	1	<0-05	<0-05	<0-05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2
Zinc	milligrams per kilogram	1	1	0-018	0-018	0-018

Monitoring Point 20

Groundwater quality monitoring, Monitoring point labelled BH6 on Figure 15 titled "Current Site Investigation Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297807.4 N6184052

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	4	4	707	749	794
Aluminium	milligrams per litre	1	1	0-33	0-33	0-33
Arsenic	milligrams per litre	1	1	0 002	0-002	0-002
Barium	milligrams per litre	1	1	0-047	0-047	0-047

Benzene	milligrams per litre	1	1	<1	<1	<1
Cadmium	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Calcium	milligrams per litre	4	4	110	120.75	130
Chloride	milligrams per litre	4	4	120	821.5	1150
Chromium (hexavalent)	milligrams per litre	1	1	<0.01	<0.01	<0.01
Chromium (total)	milligrams per litre	1	1	<0.001	<0.001	<0.001
Cobalt	milligrams per litre	1	1	0.008	0.008	0.008
Conductivity	microsiemens per centimetre	4	4	4050	4752.5	5040
Copper	milligrams per litre	1	1	0.007	0.007	0.007
Ethyl benzene	micrograms per litre	1	1	<2	<2	<2
Fluoride	milligrams per litre	1	1	0.9	0.9	0.9
Lead	milligrams per litre	1	1	0.002	0.002	0.002
Magnesium	milligrams per litre	4	4	129	127.5	135
Manganese	micrograms per litre	1	1	1.68	1.68	1.68
Mercury	milligrams per litre	1	1	<0.0001	<0.0001	<0.0001
Nitrate	milligrams per litre	1	1	0.6	0.6	0.6

Nitrite	milligrams per litre	1	1	<0.01	<0.01	<0.01
Nitrogen (ammonia)	milligrams per litre	4	4	0.09	0.135	0.22
Organochlorine pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
Organophosphate pesticides	milligrams per litre	1	1	<0.5	<0.5	<0.5
pH	pH	4	4	6.7	6.8	6.9
Polycyclic aromatic hydrocarbons	milligrams per litre	1	1	<1	<1	<1
Potassium	milligrams per litre	4	4	1	1	1
Sodium	milligrams per litre	4	4	780	827.75	916
Standing Water Level	metres	4	4	1.34	1.44	1.56
Sulfate	milligrams per litre	4	4	262	301	329
Toluene	milligrams per litre	1	1	<2	<2	<2
Total dissolved solids	milligrams per litre	4	4	2400	2617.5	2820
Total organic carbon	milligrams per litre	4	4	1	4	5
Total Phenolics	milligrams per litre	1	1	0.05	0.05	0.05
TPH	milligrams per litre	1	1	<50	<50	<50
Xylene	milligrams per litre	1	1	<2	<2	<2

Zinc	milligrams per kilogram	1	1	0.025	0.025	0.025

Monitoring Point 21

Subsurface gas monitoring, Monitoring point labelled LFG MW1 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298084 N6184278

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0.0001	.000357	0.0007

Monitoring Point 22

Subsurface gas monitoring, Monitoring point labelled LFG MW2 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298202 N6184228

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0	0.000386	0.0009

Monitoring Point 23

Subsurface gas monitoring, Monitoring point labelled LFG MW3 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298297 N6184244

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0	0.000214	0.0004

Monitoring Point 24

Subsurface gas monitoring, Monitoring point labelled LFG MW4 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0	0.000214	0.0004

Monitoring Point 25

Subsurface gas monitoring, Monitoring point labelled LFG MW6 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298438 N6184381

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0	0.000529	0.0012

Monitoring Point 26

Subsurface gas monitoring, Monitoring point labelled LFG MW6 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0	0.001000	0.0019

Monitoring Point 27

Subsurface gas monitoring, Monitoring point labelled LFG MW7 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298470 N6184553

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0.0012	0.003271	0.0056

Monitoring Point 28

Subsurface gas monitoring, Monitoring point labelled LFG MW8 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298376 N6184303

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0.0008	0.002143	0.0036

Monitoring Point 29

Subsurface gas monitoring, Monitoring point labelled LFG MW9 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298465 N6184645

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0.0014	0.004633	0.0079

Monitoring Point 30

Subsurface gas monitoring, Monitoring point labelled LFG MW10 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298448 N6184684

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0	0.000643	0.0014

Monitoring Point 31

Subsurface gas monitoring, Monitoring point labelled LFG MW11 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298400 N6184695

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value

Methane	percent by volume	12	7	0.0005	0.000857	0.0014

Monitoring Point 32

Subsurface gas monitoring, Monitoring point labelled LFG MW12 on Figure 14 titled "Proposed Landfill Gas Monitoring Locations" dated 6 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E298361 N6184701

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Methane	percent by volume	12	7	0.0003	0.022157	0.0853

Monitoring Point 33

Stormwater monitoring point, Downstream monitoring point labelled 4 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297767 N6183396

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	1	8	50	107	186
Ammonia	milligrams per litre	1	8	0.02	0.11	0.37
Calcium	milligrams per litre	1	8	13	23.75	41
Chloride	milligrams per litre	1	8	26	41.25	62
Conductivity	microsiemens per centimetre	1	8	240	380.25	598
Dissolved Oxygen	milligrams per litre	1	8	2.28	7.22	8.98
Filterable iron	milligrams per litre	1	8	0.03	0.85	5.02

Fluoride	milligrams per litre	1	8	0-1	0·25	0-5
Magnesium	milligrams per litre	1	8	7	11·5	19
Nitrate	milligrams per litre	1	8	0-01	0·53	1-83
pH	pH	1	8	6-9	7-33	7-5
Potassium	milligrams per litre	1	8	3	4	5
Sodium	milligrams per litre	1	8	20	33-88	55
Sulfate	milligrams per litre	1	8	2	16·63	27
Temperature	degrees Celsius	1	8	13-8	17-45	23-5
Total organic carbon	milligrams per litre	1	8	2	7-38	12
Total Phenolics	milligrams per litre	1	8	0-05	0-05	0·05
Total suspended solids	milligrams per litre	1	8	5	81-84	464

Monitoring Point 34

Stormwater monitoring point, Upstream monitoring point labelled 6 on Figure 13 titled "Proposed Surface Water Monitoring Locations" dated 26 March 2012 (Whytes Gully New Landfill Cell EA - Volume IV). E297495 N6184504

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	1	8	43	105-63	192
Ammonia	milligrams per litre	1	8	0-01	0-021	0-060

Calcium	milligrams per litre	1	8	12	26-88	54
Chloride	milligrams per litre	1	8	25	41-25	56
Conductivity	microsiemens per centimetre	1	8	21-5	379-88	644
Dissolved Oxygen	milligrams per litre	1	8	3-33	8-44	9-96
Filterable iron	milligrams per litre	1	8	0-05	0-25	0-38
Fluoride	milligrams per litre	1	8	0-1	0-138	0-2
Magnesium	milligrams per litre	1	8	6	12-25	24
Nitrate	milligrams per litre	1	8	0-01	0-66	2-87
pH	pH	1	8	7	7-55	8
Potassium	milligrams per litre	1	8	2	3-38	6
Sodium	milligrams per litre	1	8	15	30-88	52
Sulfate	milligrams per litre	1	8	14	21-5	41
Temperature	degrees Celsius	1	8	13-5	17-35	23-9
Total organic carbon	milligrams per litre	1	8	2	6-38	10
Total Phenolics	milligrams per litre	1	8	0-05	0-05	0-05
Total suspended solids	milligrams per litre	1	8	5	20-51	93-3

B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables provided below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

C Statement of Compliance - Licence Conditions

C1 Compliance with Licence Conditions

(☑ the boxes)

1 Were all conditions of the licence complied with (including monitoring and reporting requirements)? ☑ Yes ☐ No

(✓ a box)

2 If you answered 'No' to question 1, please supply the following details for each non -compliance in the format, or similar format , provided on the following page.

Please use a separate page for each licence condition that has not been complied with.

a) What was the specific licence condition that was not complied with?

b) What were the particulars of the non -compliance?

c) What were the date(s) when the non -compliance occurred, if applicable?

d) If relevant, what was the precise location where the non -compliance occurred?

Attach a map or diagram to the Statement to show the precise location.

e) What were the registrati on numbers of any vehicles or the chassis number of any mobile plant involved in the non -compliance?

f) What was the cause of the non -compliance?

g) What action has been, or will be, taken to mitigate any adverse effects of the non -compliance?

h) What action has been, or will be, taken to prevent a recurrence of the non -compliance?

3. How many pages have you attached?

Each attached page must be initialled by the person(s) who signs Section G of this Annual Return

0

C2 Details of Non-Compliance with Licence

Licence condition number not complied with
Summary of particulars of the non-compliance **(NO MORE THAN 50 WORDS)**
If required, further details on particulars of non-compliance
Date(s) when the non-compliance occurred, if applicable
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
Cause of non-compliance
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
Action taken or that will be taken to prevent a recurrence of the non-compliance

D Statement of Compliance - Load-Based Fee Calculation Worksheets

If you are not required to monitor assessable pollutants by your licence, no worksheets will appear below. Please go to Section E.

If assessable pollutants have been identified on your licence (see licence condition L2), complete the following worksheets for each assessable pollutant to determine your load-based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in the EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been sent to you with your licence. If you require additional copies you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

D1 - D8 (Not Applicable)

E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Is the PIRMP available at the premises?

(✓ a box) ☑ Yes ☐ No

3 Is the PIRMP available in a prominent position on a publicly accessible web site?

(✓ a box) ☑ Yes ☐ No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address www.wollongong.nsw.gov.au/services/household/pages/wastestrategyfiscalmonitoringdata.aspx

4 Has the PIRMP been tested?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on 19 May 2015

5 Has the PIRMP been updated?

(✓ a box) ☐ Yes ☑ No

If you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on

6 How many times has the PIRMP been activated in this reporting period? 0

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated

The PIRMP was activated on

The EPA's guidelines for preparation of pollution incident response management plans are available at

http://www.epa.nsw.gov.au/legislation/20120227eqpreppirmp.htm

F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(✓ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(✓ a box) ☑ Yes ☐ No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(✓ a box) ☑ Yes ☐ No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address www.wollongong.nsw.gov.au/services/household/pages/wastesitesanalyticalmonitoringdata.aspx

The EPA's written requirements for publishing pollution monitoring data are available at http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm

Note - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data.

G Signature and Certification

This Annual Return may only be signed by a person(s) with legal authority to sign it as set out in the categories below. **Please tick (✓) the box** next to the category that describes how this Annual Return is being signed.

If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700.

If the licence holder is:		the Annual Return must be signed and certified:
an individual	☐	by the individual licence holder, or
	☐	by a person approved in writing by the EPA to sign on the licence holder's behalf
a company	☐	by affixing the common seal in accordance with Corporations Act 2001, or
	☐	by 2 directors, or
	☐	by a director and a company secretary, or
	☐	if a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	☐	by a person delegated to sign on the company's behalf in accordance with the Corporations Act 2001 and approved in writing by the EPA to sign on the company's behalf.
a public authority (other than a council)	☐	by the Chief Executive Officer of the public authority, or
	☐	by a person delegated to sign on the public authority's behalf in accordance with its legislation and approved in writing by the EPA to sign on the public authority's behalf.
a local council	☐	by the General Manager in accordance with s.377 of the Local Government Act 1993, or
	☐	by affixing the seal of the council in a manner authorised under that Act.

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of $250,000 for a corporation or $120,000 for an individual.

I/We

- *declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and*
- *certify that the information in the Statement of Compliance in sections A, C, D, E and F and any pages attached to Section C is correct and not false or misleading in a material respect.*

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates below and specify the new dates to which this Annual Return relates below:

For the reporting period 29-May-2014 to 28-May-2015 or ___/___/___ to ___/___/___

SIGNATURE [signature] SIGNATURE

NAME (printed) Sandra Belanszky NAME (printed) David Farmer

POSITION Waste Operations Administrator POSITION General Manager

DATE 22/07/2015 DATE ___/___/___

SEAL(if signing under seal)

PLEASE ENSURE THAT ALL APPROPRIATE BOXES HAVE BEEN COMPLETED AND THAT THE CHECKLIST ON PAGE 2 OF THE ANNUAL RETURN HAS BEEN COMPLETED

Wollongong City Council

Whytes Gully Waste Disposal Facility
Annual Report

Period 01 June 2012 – 31 May 2013

Reference Z13 / 131625

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Wollongong DC NSW 2500
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ABBREVIATIONS

Al	Aluminium
ANZECC	Australian and New Zealand Environment Conservation Council
Ar	Arsenic
Ba	Barium
Ca	Calcium
$CaCO_3$	Calcium Carbonate
Cd	Cadmium
CH_4	Methane
Cl	Chloride
Co	Cobalt
Cr	Chromium
Cu	Copper
DC	Development Consent
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
F	Fluoride
K	Potassium
LEMP	Landfill Environmental Management Plan
Mg	Magnesium
Mn	Manganese
Na	Sodium
NH_3	Ammonia
NO_3	Nitrate
NO_2	Nitrite

ppm	Parts per Million
SO_4	Sulfate
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
WWARRP	Wollongong Waste and Resource Recovery Park
Zn	Zinc

1 INTRODUCTION

1.1 BACKGROUND

The City of Wollongong is located 80 kilometres south of Sydney and is Australia's 9th largest city. The Wollongong City Council (Council) governance area occupies a relatively narrow coastal strip bordered by the Royal National Park to the north, the Windang Bridge and Yallah to the south, the Tasman Sea to the east and the escarpment to the west.

Council owns and operates the Wollongong Waste and Resource Recovery Park (the site), which is located on Reddalls Road at Kembla Grange. The site is situated south west of Wollongong's central business district on approximately 50 hectares and is comprised of Lots 50, 52 and 53 of DP 1022266 and Lot 2 of DP 240557.

Council holds an Environmental Protection Licence (EPL) number 5862, for 'Waste Disposal – Application to Land' for the site. Council currently operates in accordance with the sites Landfill Environmental Management Plan (LEMP) in accord with the requirements of the sites EPL and Development Consent (DC).

1.2 OBJECTIVES OF THE ANNUAL REPORT

Condition R1.10 of the EPL specifies that Council must provide an Annual Report to accompany the Annual Return for the site. The objective of this report is to provide that review.

1.3 SITE HISTORY

Whytes Gully was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. Initially, the 'western gully' section was landfilled. The western gully is unlined by modern standards and was used from 1982 to 1993. Initially coal wash refuse was used to provide daily cover, then around 1988/89 steel furnace slag was introduced because of its stability in wet weather and Council's inability to source local clean fill in sufficient quantities. The leachate collection from the western gully is through a series of rock drains at the centre of each lift. The rock drains connect with a riser and the leachate flows from riser to riser, and then to the leachate collection well at the base of the western gully. The western gully section of the landfill has been capped with clay to varying depths between 1m and 4m.

The 'eastern gully' section development received consent in 1992/93, following extensive public consultation. The eastern gully section is lined with a single layer of HDPE smooth liner, over a subsoil drainage layer of 5mm

gravel and a corrugated groundwater drainage system. The eastern gully was excavated to rock and was developed in two stages, beginning with the first stage 80 to 100m above the slope from the current toe of the landfill embankment. The leachate is drained from the first stage of the eastern gully via a 300mm corrugated drainage pipe at the base and a 300mm thick sand layer above the liner.

The second stage of the eastern gully operates in front and above the first stage, with extended leachate drains and HDPE liner. The eastern gully has intermediate cover of varying quality on the embankments.

Leachate is collected from all landfilled areas at the site and treated in a 3 stage process. The leachate is initially collected in a primary holding pond that uses a biological process and aeration primarily to strip the leachate of ammonia. The leachate is then pumped to a smaller pond with a greater surface area to increase the speed of this process. From the smaller pond the leachate is then pumped to a sequence batch reactor that in conjunction with a filtration system eliminates the residual contaminants in the leachate suitable for acceptance by sewer under the sites Trade Wastewater Agreement with Sydney Water.

1.4 RELEVANT DOCUMENTS

This annual report refers to and / or draws upon information and data from the following documents;

- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2011 to 31 May 2012. By Wollongong City Council July 2012
- Whytes Gully Waste Disposal Facility – Annual Return for Period 01 June 2010 to 31 May 2011. By Wollongong City Council July 2011.
- Whytes Gully Waste Disposal Facility – Annual Report for Period 01 June 2009 to 31 May 2010. By GHD July 2010.

2 KEY LICENCE ISSUES

2.1 ENVIRONMENTAL PROTECTION LICENCE ANNUAL RETURNS

The Environment Protection Authority (EPA) has issued an ***Environmental Protection Licence*** (Licence No. 5862) for the landfill and recycling operations on the Whytes Gully site. The licence, issued under the ***Protection of the Environment Operations Act 1997,*** requires an annual return to be submitted to the EPA, detailing;

a) Statement of compliance; and

b) Monitoring and complaints summary, including responses.

c) Tabulated results of all monitoring data required by the licence.

d) A graphical presentation of the data for at least three years (if available).

e) Notations made regarding any statistically significant variations or anomalies.

f) An analysis and interpretation of all monitoring data.

g) Identification of any deficiencies in environmental performance and action taken.

h) Recommendations on improving the sites environmental performance.

The EPL Annual Returns for 2008 to 2012 reporting periods were reviewed to provide a background to this report. These Annual Returns can be summarised as follows:

01 June 2008 to 31 May 2009

B1. Pollution complaints - Nine

B2. Concentration monitoring summary – Complete.

B3. Volume or mass monitoring summary - None required.

C1. Compliance with licence condition – Ten non compliances.

C2. Details of non-compliance

1. ***Stormwater pH measurement > 8.5***
2. ***Four missed stormwater conductivity measurements***
3. ***Stormwater suspended solids > 50mg/L twice***
4. ***Four missed potassium groundwater measurements***
5. ***One missed groundwater redox, coliforms and dissolved oxygen measurements***
6. ***Three missed groundwater alkalinity measurements***
7. ***One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium tests***

8. ***One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test***
9. ***One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test***
10. ***One missed groundwater calcium, chloride, magnesium, sodium, sulphate and potassium test***

01 June 2009 to 31 May 2010

B1. Pollution complaints - Twelve
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Five non compliances
C2. Details of non-compliance

1. ***Two missed stormwater temperature measurements***
2. ***Missed stormwater filterable iron measurement***
3. ***One round of groundwater monitoring missed***
4. ***One round of groundwater monitoring missed***
5. ***One round of landfill gas monitoring missed***

01 June 2010 to 31 May 2011

B1. Pollution complaints – Twelve
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non compliances
C2. Details of non-compliance – N/A

01 June 2011 to 31 May 2012

B1. Pollution complaints – Forty Eight
B2. Concentration monitoring summary – Complete.
B3. Volume or mass monitoring summary - None required.
C1. Compliance with licence condition – Zero non compliances
C2. Details of non-compliance – N/A

In summary, compliance issues have generally been restricted to minor exceedances of pH and suspended solids in the sediment pond, and these issues are covered by ongoing monitoring provisions.

A potential problem existed prior to June 2010 with seemingly regular missed analytical testing regimes over the previous 2 years. Subsequently, Council formally tendered for the environmental testing at the site, which now ensures regular testing routines are in place under contract performance requirements.

The EPL has had several variations applied to it in recent years. These changes include:

- Addition of pollution studies and reduction programs added on 28 November 2008.

- Scheduled Activity and Waste Classification structure changed on 17 October 2008.

- Reformatted licence including specification for cover material, litter control and other operational processes 20 November 2007.

- Clarification of water pollution prevention requirements on 11 October 2005.

- Overhauled and reformatted licence resulting from Council's request to modernise environmental testing requirements and to formally recognise the increased environmental sampling points and standards adopted by Council for the site. The request formed Annexure B of the 2010/2011 Annual Environmental Management Report and was formally approved and adopted by the EPA on 16 April 2012.

3 REVIEW OF LANDFILL MONITORING DATA

3.1 GROUNDWATER MONITORING

Recent site investigations resulting from Council's Environment Application lodged with the State Government on 01 April 2012, have confirmed a predominant approximate south-southwest groundwater flow direction. The groundwater flow direction should be used to contextualise monitoring bore locations and elevated results, please refer to the sites Environmental Monitoring Locations located in Annexure A of this document.

3.1.1 Tabulated Results

Analyte	23 August 2012												
	Units	1a	2a	3a	4a	5a	6a	7a	1	3	4	5	6
Alkalinity	mg/L	Dry	Dry	Dry	484	764	1000	Dry	175	1060	248	684	727
Calcium	mg/L	Dry	Dry	Dry	56	161	232	Dry	95	138	31	111	119
Chloride	mg/L	Dry	Dry	Dry	214	1830	1550	Dry	1560	968	408	1590	1100
Magnesium	mg/L	Dry	Dry	Dry	35	251	319	Dry	138	163	30	157	126
Nitrogen	mg/L	Dry	Dry	Dry	1.48	0.02	0.02	Dry	<0.12	0.06	0.08	1.3	0.06
Potassium	mg/L	Dry	Dry	Dry	5	<1	<1	Dry	<1	<1	<1	9	<1
Sodium	mg/L	Dry	Dry	Dry	249	1640	1280	Dry	1060	716	358	1130	853
Water Level	m	Dry	Dry	Dry	2.14	2.5	2.93	Dry	3.49	1.59	1.75	6.21	1.42
Sulfate	mg/L	Dry	Dry	Dry	65	592	977	Dry	414	173	174	204	317
TDS	mg/L	Dry	Dry	Dry	804	4440	5140	Dry	3440	2700	1030	3700	2750
TOC	mg/L	Dry	Dry	Dry	4	<1	<1	Dry	<1	<1	<1	30	<1
pH	pH	Dry	Dry	Dry	7.6	7.1	7	Dry	6.1	7.2	6.3	6.3	6.8

Table 3.1.1(a) Quarterly analyte testing results for August 2012

Analyte	13 November 2012												
	Units	1a	2a	3a	4a	5a	6a	7a	1	3	4	5	6
Alkalinity	mg/L	Dry	Dry	Dry	212	553	970	Dry	232	969	145	295	688
Calcium	mg/L	Dry	Dry	Dry	41	118	243	Dry	78	131	21	66	122
Chloride	mg/L	Dry	Dry	Dry	258	2290	1940	Dry	1300	1060	226	129	1260
Magnesium	mg/L	Dry	Dry	Dry	28	194	378	Dry	84	151	14	27	129
Nitrogen	mg/L	Dry	Dry	Dry	0.87	0.02	0.02	Dry	<0.01	0.11	0.03	0.5	0.1
Potassium	mg/L	Dry	Dry	Dry	4	<1	1	Dry	<1	<1	4	6	<1
Sodium	mg/L	Dry	Dry	Dry	212	1360	1410	Dry	755	684	176	164	842
Water Level	m	Dry	Dry	Dry	2.34	2.7	3.19	Dry	4.08	2.17	2.22	8	1.58
Sulfate	mg/L	Dry	Dry	Dry	152	542	1520	Dry	246	159	88	9	322
TDS	mg/L	Dry	Dry	Dry	862	5120	6990	Dry	2530	2750	626	1100	2940
TOC	mg/L	Dry	Dry	Dry	14	2	2	Dry	2	4	5	27	4
pH	pH	Dry	Dry	Dry	7.3	7.1	6.9	Dry	6.4	7.1	6.6	7.5	6.9

Table 3.1.1(b) Quarterly analyte testing results for November 2012

Analyte	14 February 2013												
	Units	1a	2a	3a	4a	5a	6a	7a	1	3	4	5	6
Alkalinity	mg/L	Dry	Dry	Dry	200	472	932	Dry	225	965	159	Dry	685
Calcium	mg/L	Dry	Dry	Dry	53	102	225	Dry	78	140	35	Dry	127
Chloride	mg/L	Dry	Dry	Dry	120	2110	1600	Dry	975	967	24	Dry	1080
Magnesium	mg/L	Dry	Dry	Dry	26	205	353	Dry	75	180	10	Dry	143
Nitrogen	mg/L	Dry	Dry	Dry	0.18	<0.01	0.01	Dry	0.01	0.08	0.06	Dry	0.09
Potassium	mg/L	Dry	Dry	Dry	4	<1	<1	Dry	<1	<1	19	Dry	<1
Sodium	mg/L	Dry	Dry	Dry	112	1420	1340	Dry	669	762	29	Dry	855
Water Level	m	Dry	Dry	Dry	2.37	2.72	3.23	Dry	4.51	2.49	2.44	Dry	1.52
Sulfate	mg/L	Dry	Dry	Dry	96	542	1280	Dry	213	152	14	Dry	303
TDS	mg/L	Dry	Dry	Dry	564	4760	5400	Dry	2090	2690	268	Dry	2860
TOC	mg/L	Dry	Dry	Dry	21	<1	1	Dry	4	74	11	Dry	2
pH	pH	Dry	Dry	Dry	7.5	6.8	6.8	Dry	6.2	6.8	6.9	Dry	6.7

Table 3.1.1(c) Quarterly analyte testing results for February 2013

Analyte	15 May 2013												
	Units	1a	2a	3a	4a	5a	6a	7a	1	3	4	5	6
Alkalinity	mg/L	Dry	Dry	Dry	450	674	900	Dry	242	960	99	273	702
Calcium	mg/L	Dry	Dry	Dry	66	115	183	Dry	80	131	24	19	108
Chloride	mg/L	Dry	Dry	Dry	132	1590	1310	Dry	978	871	9	170	960
Magnesium	mg/L	Dry	Dry	Dry	30	186	284	Dry	76	153	6	13	122
Nitrogen	mg/L	Dry	Dry	Dry	8.74	<0.01	0.02	Dry	<0.01	0.13	0.04	0.52	0.04
Potassium	mg/L	Dry	Dry	Dry	5	<1	1	Dry	<1	<1	19	2	<1
Sodium	mg/L	Dry	Dry	Dry	142	1320	1250	Dry	685	663	9	216	838
Water Level	m	Dry	Dry	Dry	2.28	2.64	3.21	Dry	4.1	2.11	2.19	7.9	1.48
Sulfate	mg/L	Dry	Dry	Dry	42	482	1200	Dry	325	179	<10	32	323
TDS	mg/L	Dry	Dry	Dry	698	4670	5050	Dry	2450	2740	167	670	2990
TOC	mg/L	Dry	Dry	Dry	20	1	3	Dry	4	15	10	17	<4
pH	pH	Dry	Dry	Dry	7.4	6.8	6.8	Dry	6.2	6.8	7.2	6.9	7.2

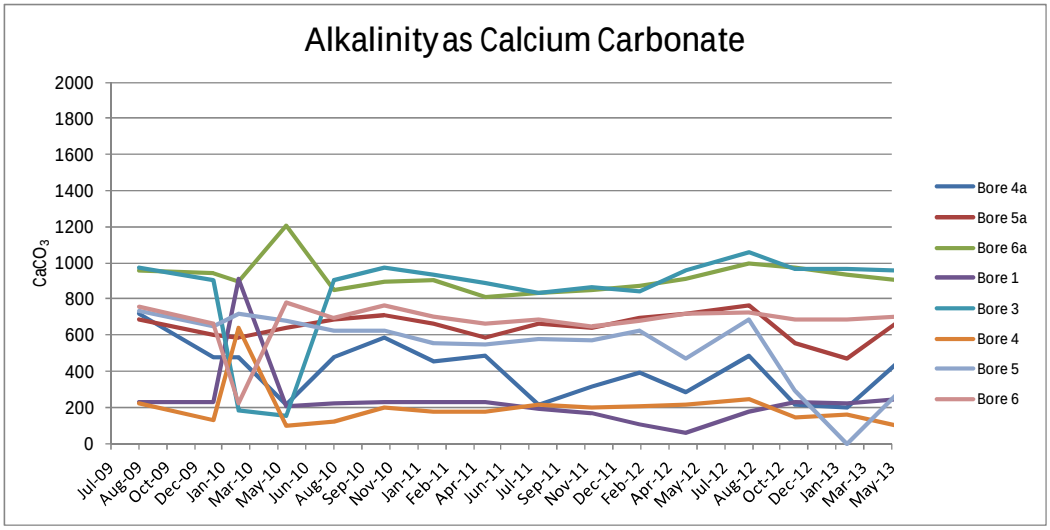
Table 3.1.1(d) Quarterly analyte testing results for May 2013

Analyte	Units	23 August 2012											
		1a	2a	3a	4a	5a	6a	7a	1	3	4	5	6
Aluminium	mg/L	Dry	Dry	Dry	0.03	0.09	0.27	Dry	0.16	0.16	0.52	3.26	0.07
Arsenic	mg/L	Dry	Dry	Dry	<0.001	<0.001	<0.001	Dry	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	Dry	Dry	Dry	0.039	0.021	0.006	Dry	0.087	0.09	0.076	0.308	0.051
Benzene	µg/	Dry	Dry	Dry	<1	<1	<1	Dry	<1	<1	<1	<1	<1
Cadmium	mg/L	Dry	Dry	Dry	<0.0001	<0.0001	<0.0001	Dry	<0.0001	<0.0001	<0.0001	0.0002	0.0002
Chromium (hex.)	mg/L	Dry	Dry	Dry	<0.01	<0.01	<0.01	Dry	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (total)	mg/L	Dry	Dry	Dry	<0.001	<0.001	0.002	Dry	<0.001	<0.001	<0.001	0.007	0.001
Cobalt	mg/L	Dry	Dry	Dry	<0.001	<0.001	<0.001	Dry	0.012	0.008	<0.001	0.019	0.011
Copper	mg/L	Dry	Dry	Dry	0.002	0.002	0.004	Dry	0.004	0.003	0.003	0.014	0.005
Ethyl Benzene	µg/L	Dry	Dry	Dry	<2	<2	<2	Dry	<2	<2	<2	<2	<2
Fluoride	mg/L	Dry	Dry	Dry	0.4	0.9	0.9	Dry	0.2	0.6	0.2	0.8	0.8
Lead	mg/L	Dry	Dry	Dry	0.002	0.002	0.003	Dry	0.004	0.002	0.003	0.022	0.004
Manganese	mg/L	Dry	Dry	Dry	0.239	0.023	0.034	Dry	1.02	0.407	0.057	2.46	1.46
Mercury	mg/L	Dry	Dry	Dry	<0.0001	<0.0001	<0.0001	Dry	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nitrate	mg/L	Dry	Dry	Dry	0.01	0.06	0.02	Dry	0.01	0.03	0.04	0.07	0.02
Nitrite	mg/L	Dry	Dry	Dry	0.02	<0.01	<0.01	Dry	<0.01	<0.01	<0.01	<0.01	<0.01
Organochlorine Pesticides	µg/	Dry	Dry	Dry	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	<0.5	<0.5
Organophosphate Pesticides	µg/	Dry	Dry	Dry	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	<0.5	<0.5
Polycyclic Aromatic Hydrocarbons	µg/	Dry	Dry	Dry	<0.5	<0.5	<0.5	Dry	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/	Dry	Dry	Dry	<2	<2	<2	Dry	<2	<2	<2	<2	<2
Total Petroleum Hydrocarbons	µg/	Dry	Dry	Dry	<50	<50	<50	Dry	<50	<50	<50	1620	<50
Total Phenolics	mg/L	Dry	Dry	Dry	<0.05	<0.05	<0.05	Dry	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene	µg/	Dry	Dry	Dry	<2	<2	<2	Dry	<2	<2	<2	<2	<2
Zinc	mg/L	Dry	Dry	Dry	0.134	0.007	0.012	Dry	0.012	0.039	0.011	0.057	0.019

Table 3.1.1(e) Annual analyte testing August 2012 results

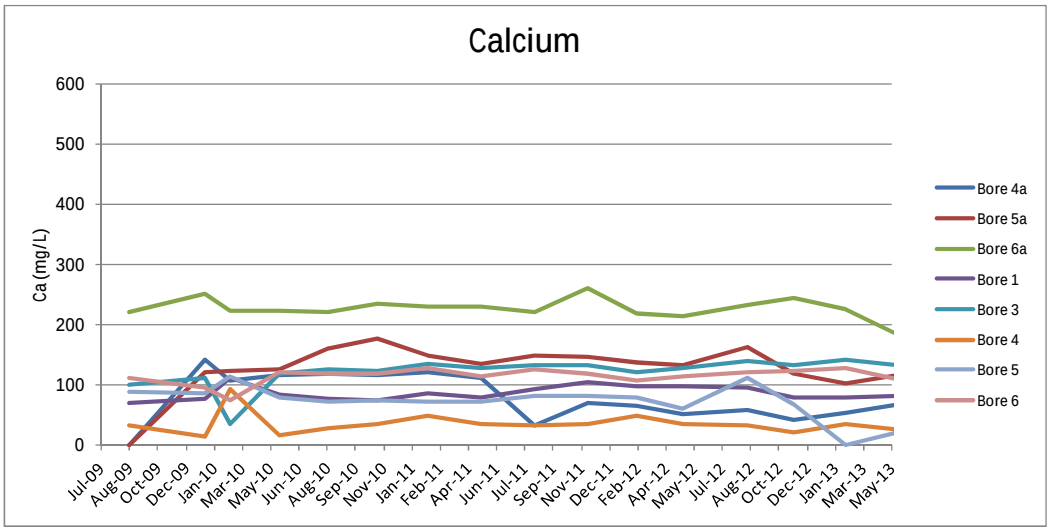
3.1.2 Data Presentation – Quarterly Monitoring

Alkalinity results presentation.



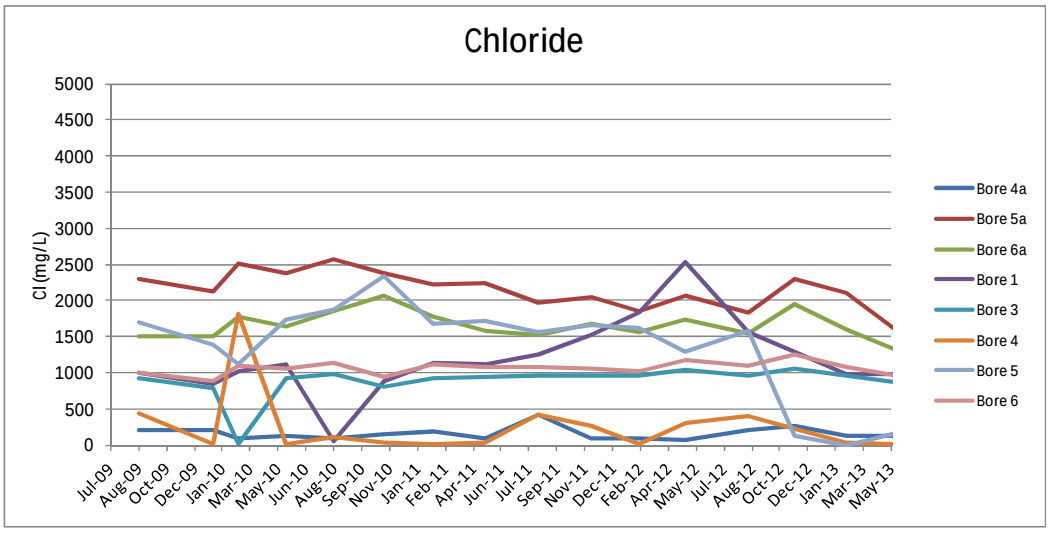
Increased alkalinity levels can be caused by many chemical processes including the denitrification process common in landfill leachate. Denitrification is the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. This process produces calcium carbonate as a by-product. The stability of the calcium carbonate in the groundwater monitoring wells over the five year sample period shows that it is unlikely that the denitrification process caused by leachate ingress is taking place in the groundwater around the site. Nonetheless, the calcium carbonate levels are relatively high and quite "hard" in plumbing terms and continued monitoring is necessary to scrutinise for any increased value trends. It should be noted that many natural groundwater sources often contain much higher alkalinity levels than this site.

Calcium results presentation.



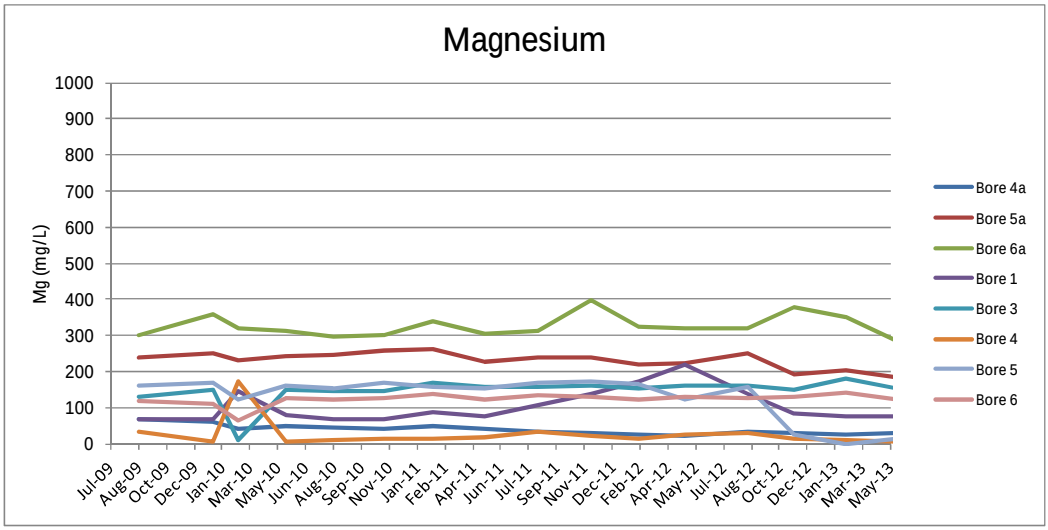
The groundwater monitoring wells show a consistent stable trend for calcium levels. The calcium levels sampled would be considered "hard" water in the region of 120-180mg/L. This is consistent with the presented results for alkalinity.

Chloride results presentation.



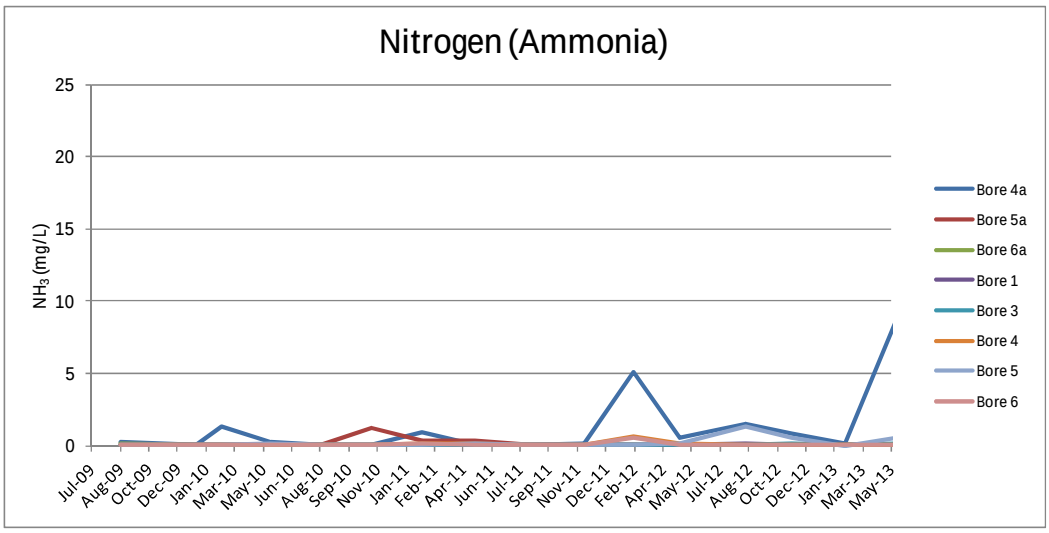
The trends realised through chloride monitoring have been in line with the historical levels over the data range available. Large quantities of inorganic ions such as chloride can be an indicator of leachate contamination of groundwater. A sudden increase in these ions can act as early warning system. The sampling history for chloride suggests that no significant spikes have occurred that has not returned to normal or historical levels and therefore leachate is not indicated in the groundwater network.

Magnesium results presentation.



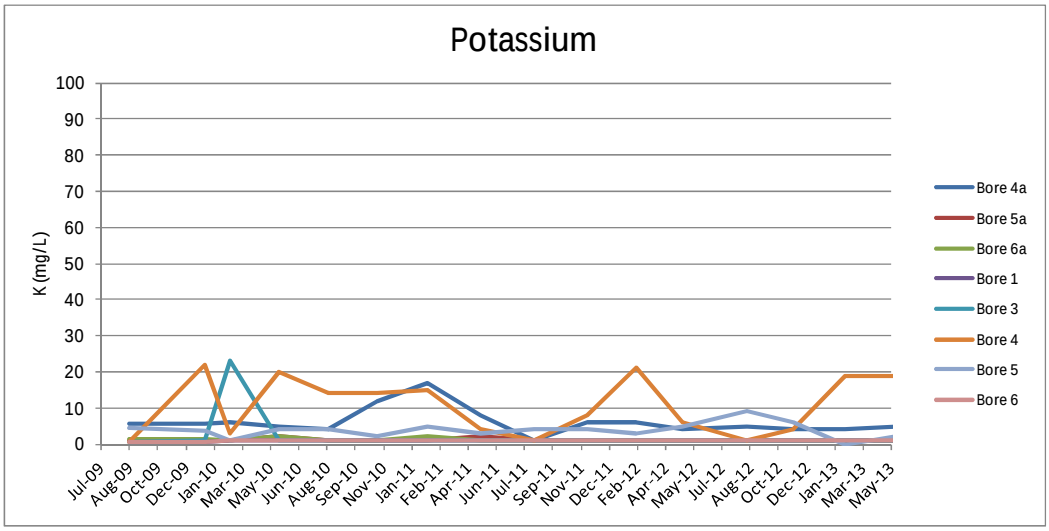
Groundwater monitoring well results are in line with historical levels and have maintained consistent levels. The magnesium levels sampled would be considered quite "hard" and consistent with other typical water hardness measures such as alkalinity and calcium.

Nitrogen as ammonia results presentation.



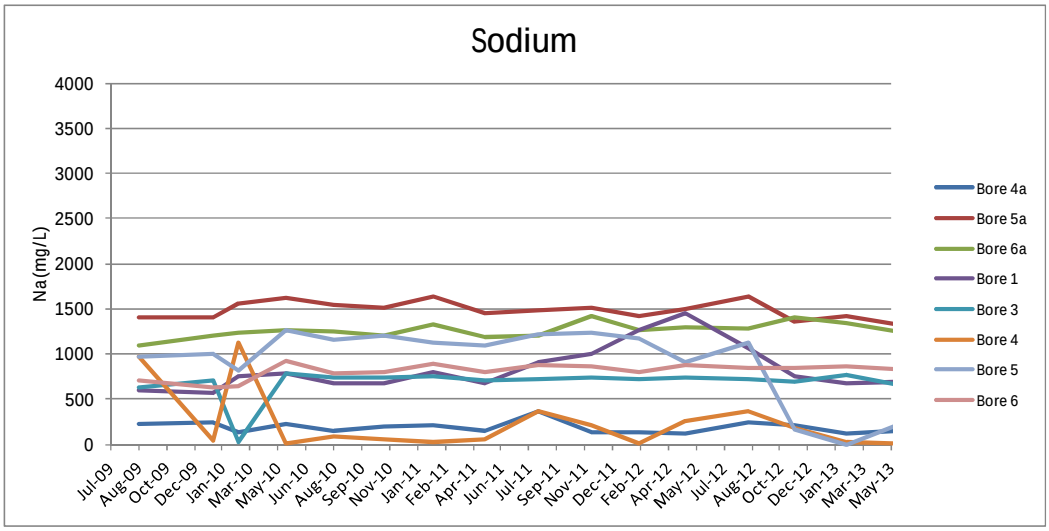
The groundwater monitoring wells indicate that ammonia levels in the groundwater are extremely low and often beneath the testing limits. Any perceived spikes have consistently tended back down towards low levels with regularity. However, even the perceived spikes are at low measurement levels close to undetectable limits. Ammonia is perhaps the clearest indicator of leachate contamination and the results from monitoring well 4a, should be carefully monitored in future sampling events to be sure that the relative spike of 8.74 mg / L from May 2013 returns back to normal low levels.

Potassium results presentation.



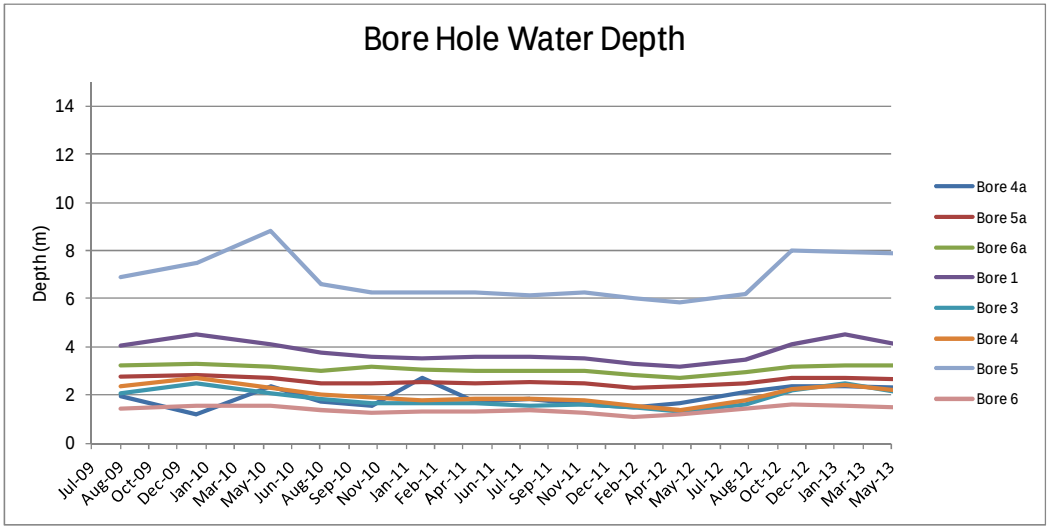
Potassium is present in groundwater systems outside coastal areas generally through weathering of clays and as a result of agriculture (leaching of fertiliser). Potassium may also be present in the breakdown of glass and especially cathode ray tubes. Groundwater monitoring wells indicate that potassium levels in the ground water have not increased relative to historic levels over the available results period. Groundwater monitoring well 4 is historically reading higher than all other bores. The area surrounding bore 4 is rich in imported clay with 2 clay stormwater ponds in close proximity. Natural surface breakdown of these clay materials due to storm events may be the reason for the elevation of potassium in Bore 4.

Sodium results presentation.



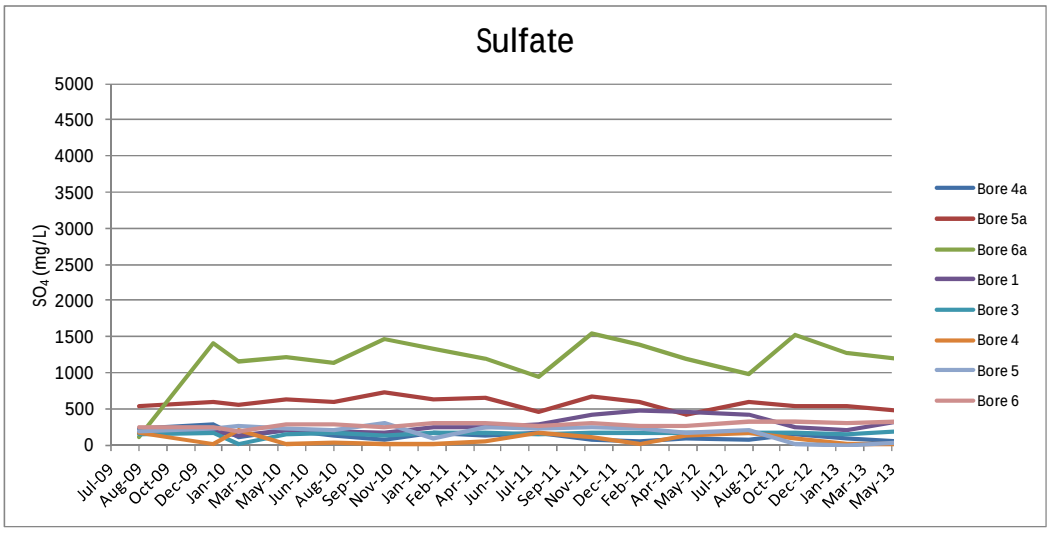
High sodium levels are indicative of leachate contamination infiltrating the groundwater. As presented, results for sodium have been stable over the history of data available.

Standing water level presentation.



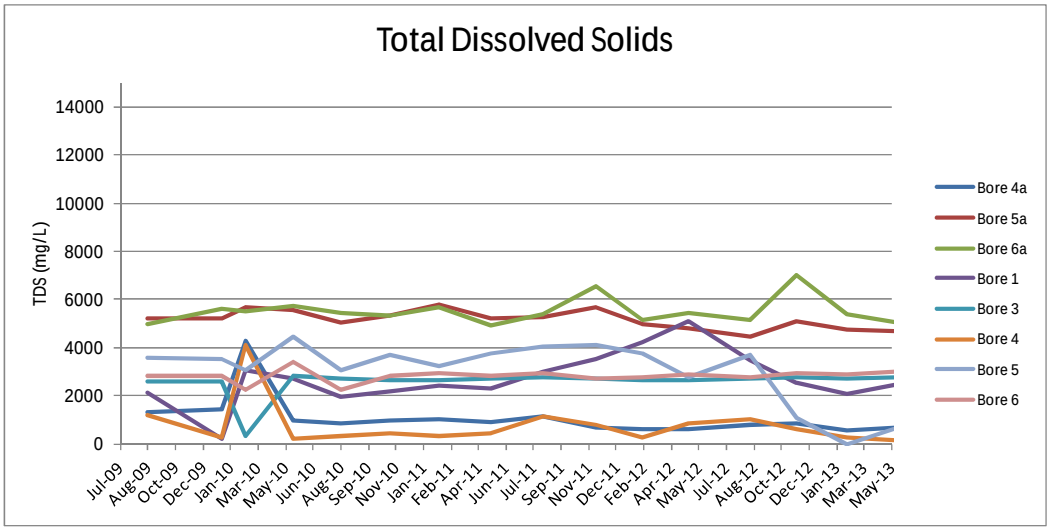
Groundwater level trends have been fairly stable, with the fluctuation over the 3 year testing period being a maximum of about 3m in Bore 5. The relatively large depth to water level in Bore 5 would indicate that it has an increased propensity to become dry.

Sulfate results presentation.



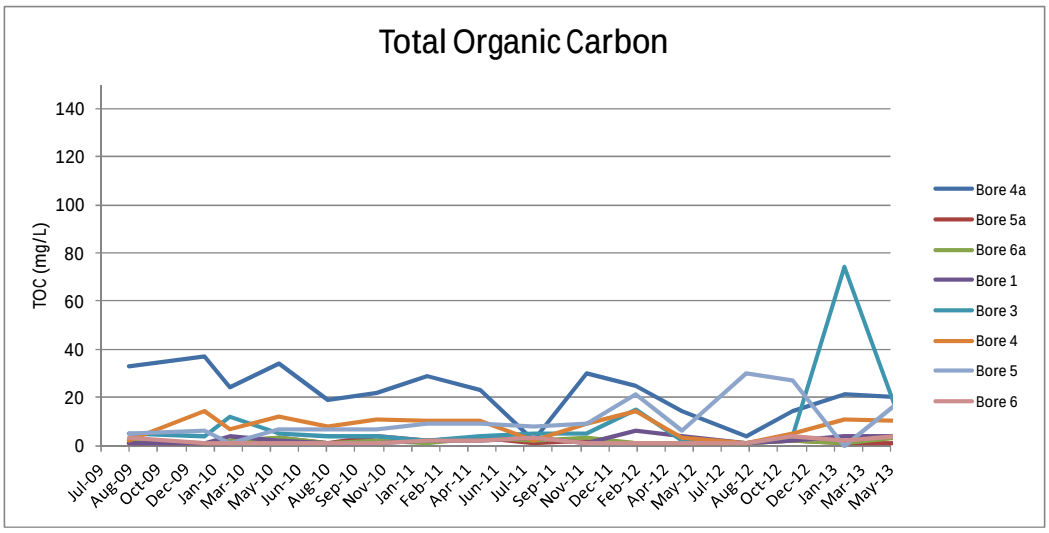
The ***2011 Australian Drinking Water Guidelines 6*** sets maximum sulfate levels in drinking water as 500mg/L. The sulfate levels in the groundwater monitoring wells are in line with the historical levels and are generally below the drinkable water standard. Inorganic ions such as sulfate provide a good indication of groundwater contamination by landfill leachate. A sudden increase in these ions can act as early warning system. Bores 5a and 6a show sulfate levels potentially higher than other bores. These bores along with Bore 4a are located on the underside of the sites primary leachate storage pond. Regular close monitoring of these 3 bores in particular should be maintained to watch for any spikes that could indicate leachate ingress.

Total dissolved solids results presentation.



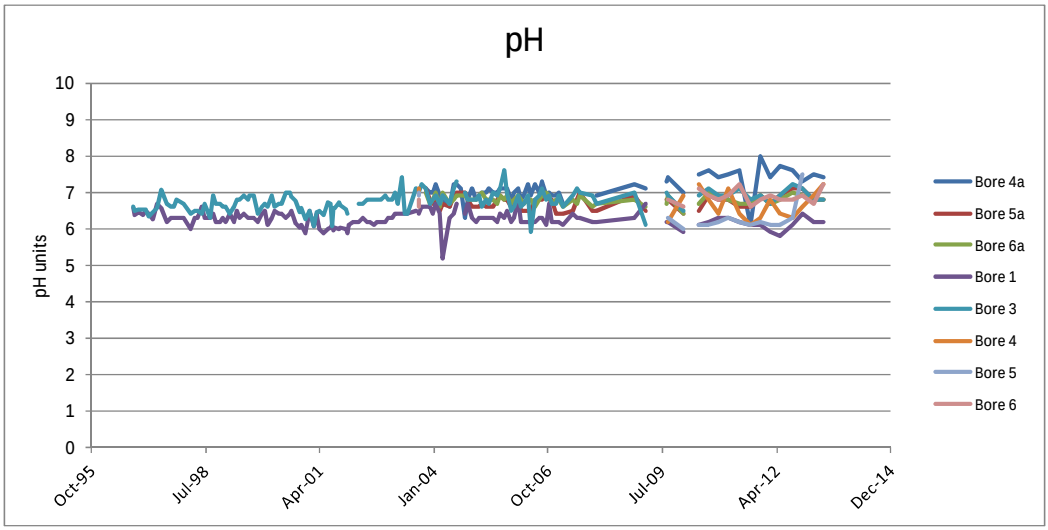
The trend for the quantity of dissolved solids has been fairly stable for the ground water monitoring wells over the reporting period, in line with historical trends. High levels of dissolved solids can be sourced from salts derived from leachate infiltration

Total organic carbon results presentation.



Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of groundwater contamination by organic compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained consistently stable over the five year results period indicating no organic leachate accumulation in the groundwater. However, a solitary spike of 74 mg/L in Bore 3 in February 2013 subsequently returned to normal low levels. Close monitoring of this bore should take place for the next sampling periods.

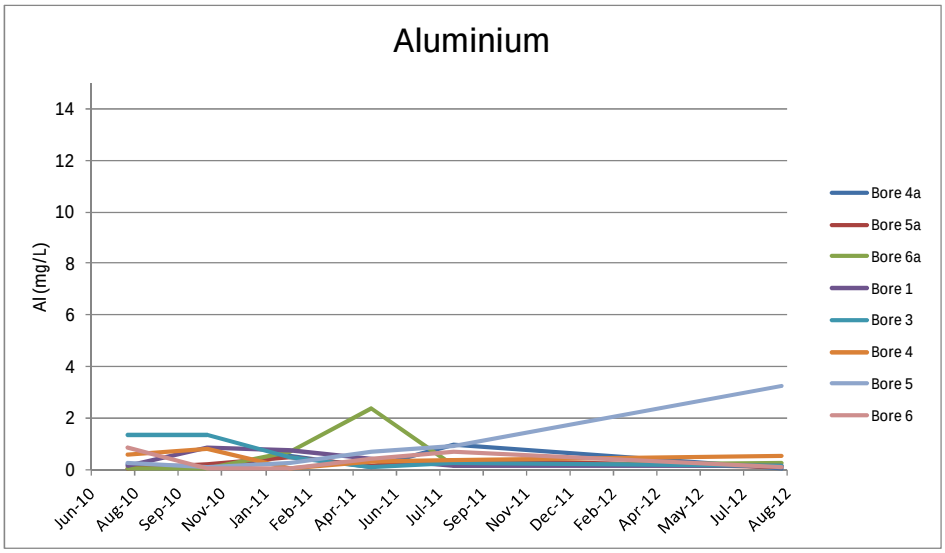
pH results presentation.



The pH levels indicated in the groundwater monitoring wells have been extremely stable over the sixteen year sample period. The fluctuations have been very small except with minor anomalies that invariably return to a stable trend. The groundwater monitoring wells indicate that the historical pH of the groundwater has been maintained over the large sample period.

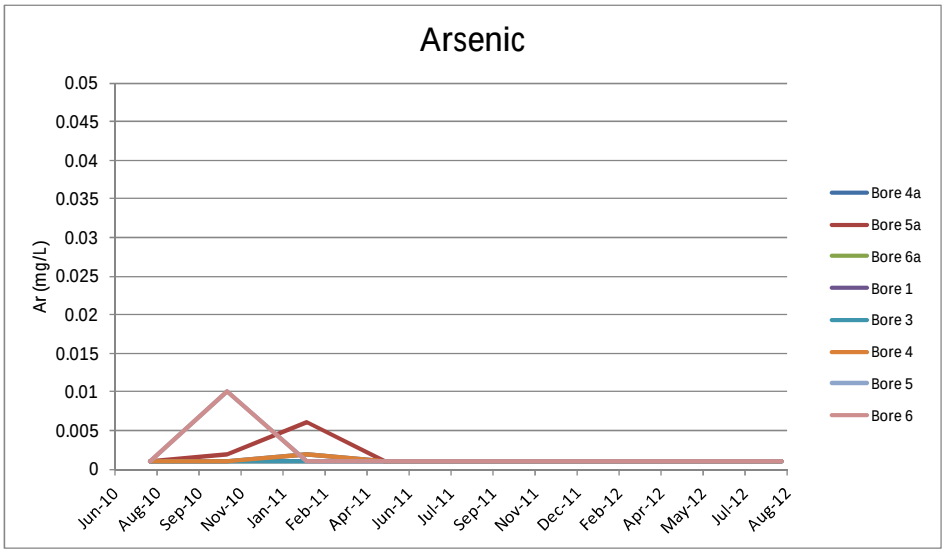
3.1.3 Data Presentation – Annual Monitoring

Aluminium results presentation



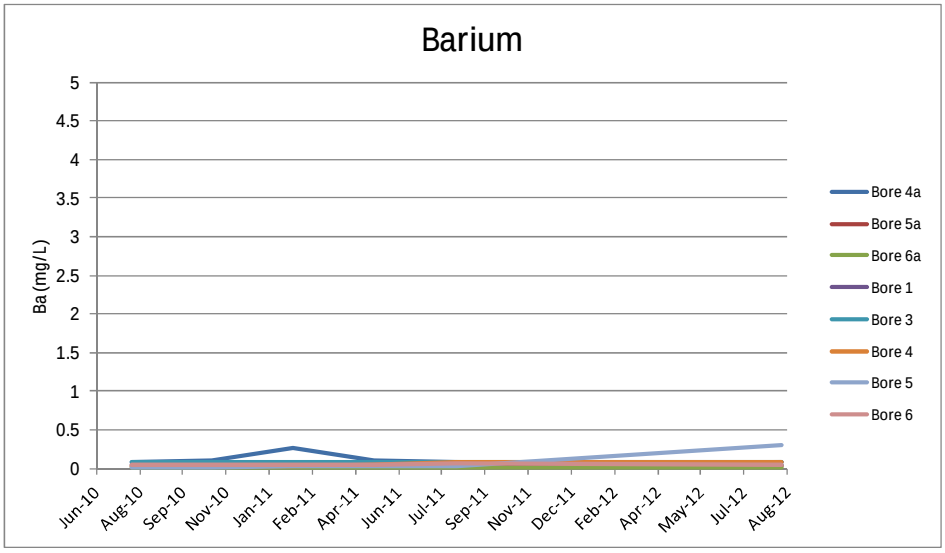
Aluminium levels in the sampled groundwater monitoring wells have been maintained at a consistent low level throughout the reporting period. Anthropogenic sources of aluminium in groundwater are generally related to low pH runoff and colliery based leachate. Bore 5 located at the base of the western gully, which ceased taking waste materials over 30 years ago, has shown a slight increasing trend over the twelve months. Whilst still at low levels, this potential trend should be closely monitored.

Arsenic results presentation



The US EPA sets the maximum contaminant level of arsenic in groundwater at 0.05mg/L. Therefore amount of arsenic found in the groundwater monitoring bores over the reporting period is extremely low. In fact arsenic levels are below detectable limits in 75% of the test results, and in 100% of results over the reporting period.

Barium results presentation

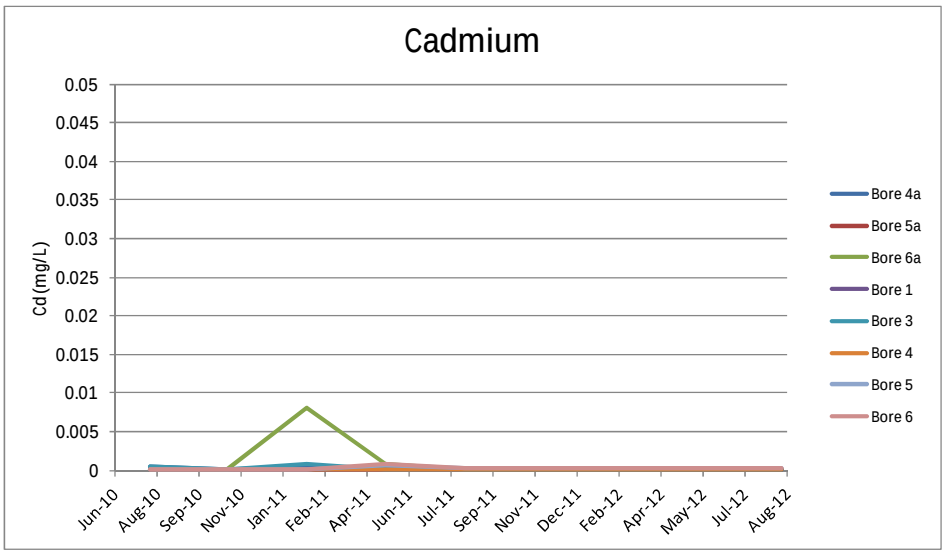


The ***2011 Australian Drinking Water Guidelines 6*** states that a maximum of 2 mg/L of barium is safe for consumption. Anthropogenic sources of barium in groundwater include bleaches, dyes and drillers mud. Barium levels are therefore extremely low and stable in the sites groundwater.

Benzene results presentation

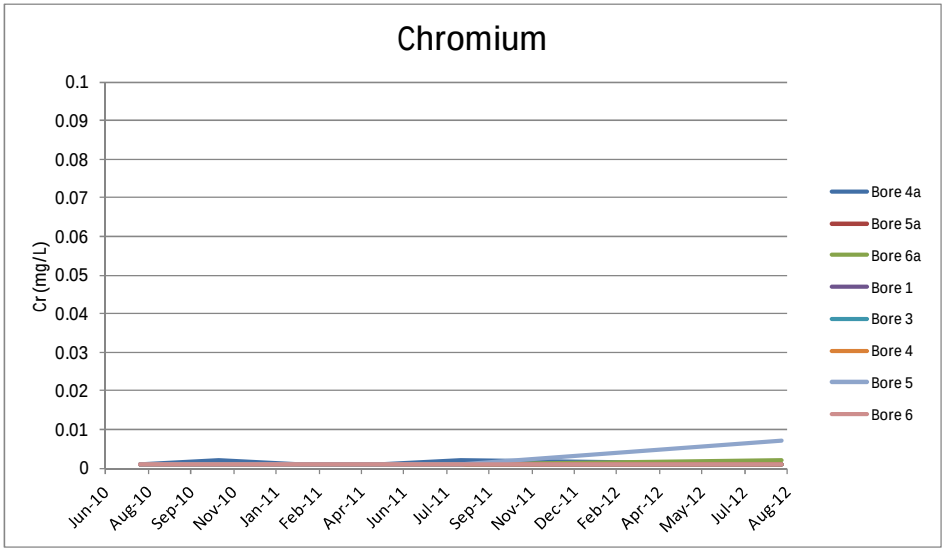
Benzene has not been modelled as every instance of sampling has not provided a result due to the concentration of benzene being below laboratory testing thresholds.

Cadmium results presentation



The US EPA sets the maximum contaminant level of cadmium in groundwater at 0.01mg/L. Cadmium levels present in the ground water monitoring bores is extremely small. Cadmium levels are always below 0.01 mg/L and below detectable limits in 75% of readings taken during the reporting period.

Chromium results presentation

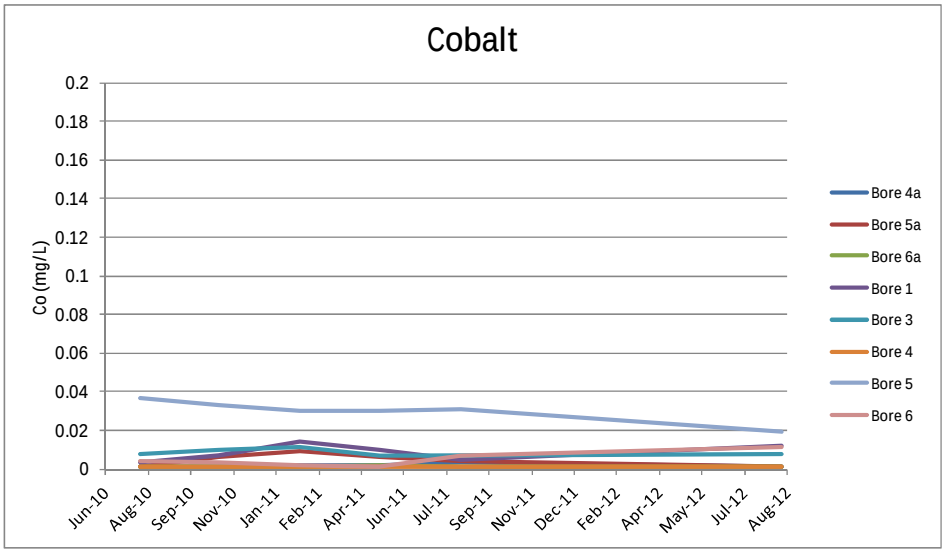


The US EPA sets the maximum contaminant level of chromium in groundwater at 0.05mg/L The levels of chromium detected in the ground water monitoring wells over the reporting period have been extremely low. Chromium levels are below detectable limits on 63% of the tested occasions.

Chromium (hexavalent) results presentation

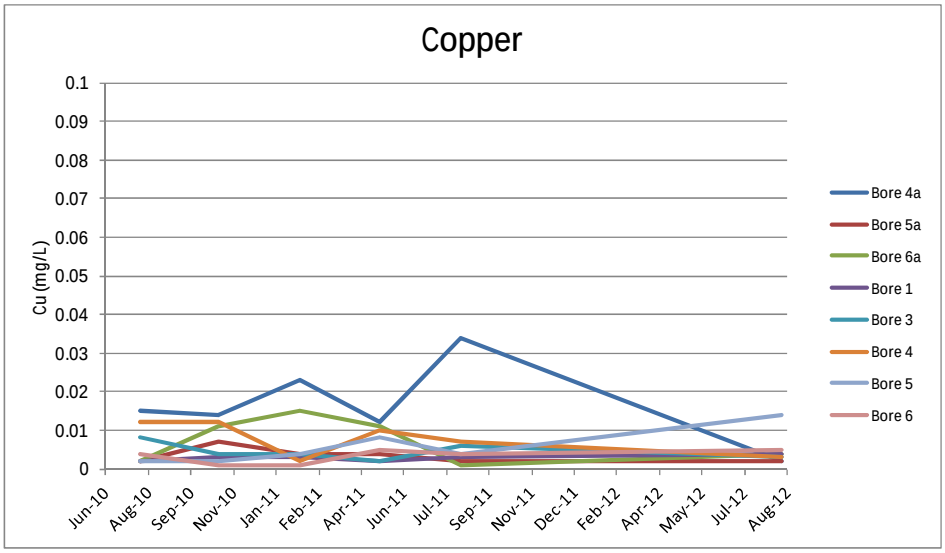
Hexavalent chromium has not been modelled as every instance of sampling has not provided a result due to the concentration of hexavalent chromium being below laboratory testing thresholds.

Cobalt results presentation



Anthropogenic sources of cobalt in the environment include agricultural runoff and sewage effluent. The amount of cobalt detected the ground water monitoring wells over the reporting period is at low levels with a consistently low trend.

Copper results presentation

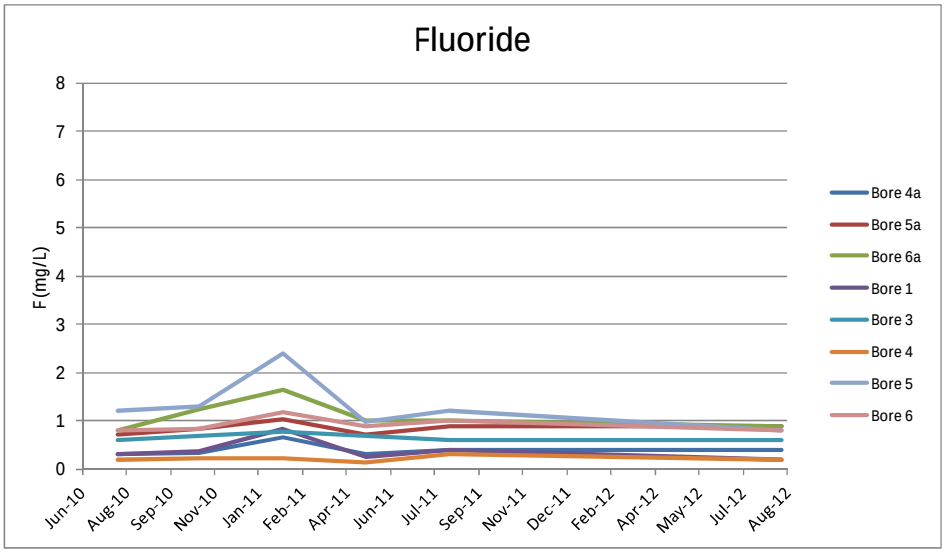


Tested results from the ground water monitoring wells show an extremely small amount of copper. The ***2011 Australian Drinking Water Guidelines 6*** prescribes an aesthetic limit of 1 mg/L of copper in drinking water. Clearly, the results therefore indicate that copper contamination is not evident.

Ethyl Benzene results presentation

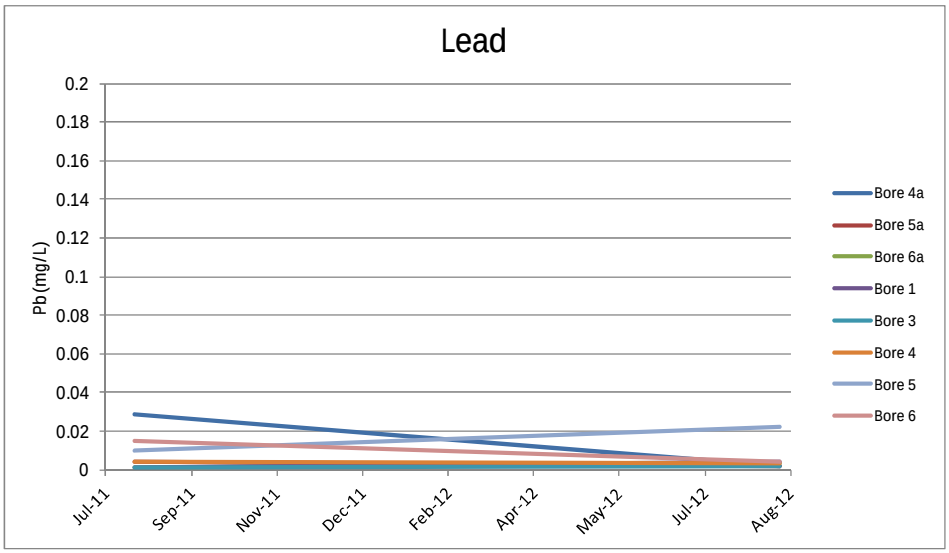
Ethyl benzene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Fluoride results presentation



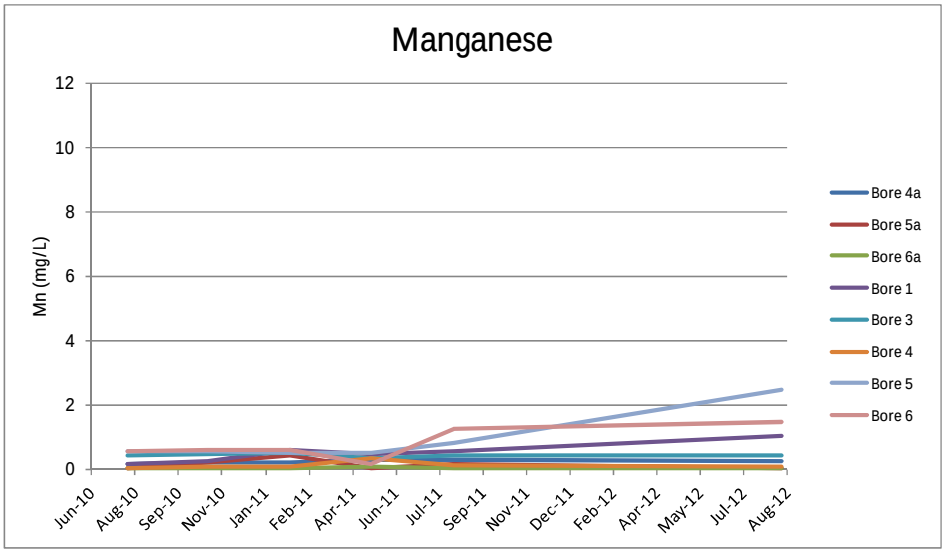
Industrial emissions are understood to be the primary anthropogenic pathway for fluoride to enter the environment. The US EPA sets the maximum contaminant level of fluoride in groundwater at 4 mg/L. Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L. The level of fluoride found in the ground water monitoring wells is therefore relatively low and displays a consistent trend over the reporting period.

Lead results presentation



Heavy metal contamination in the groundwater in the form of lead has been at very low levels over the two year sample period.

Manganese results presentation

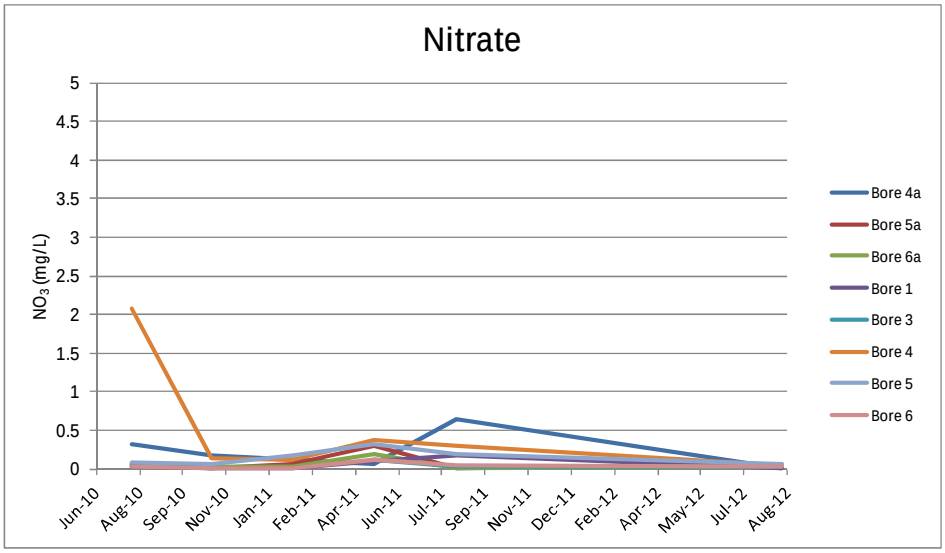


The ***2011 Australian Drinking Water Guidelines 6*** states that a maximum of 0.5 mg/L of manganese is safe for consumption. Manganese can be a strong indicator of landfill leachate in groundwater leached from hazardous waste sites and often derived from battery disposal. The levels of manganese found in August 2012 have shown a slight increase of Manganese in the groundwater. Further, sampling is due in August 2013 and should be reviewed to identify if an elevating trend is emerging.

Mercury results presentation

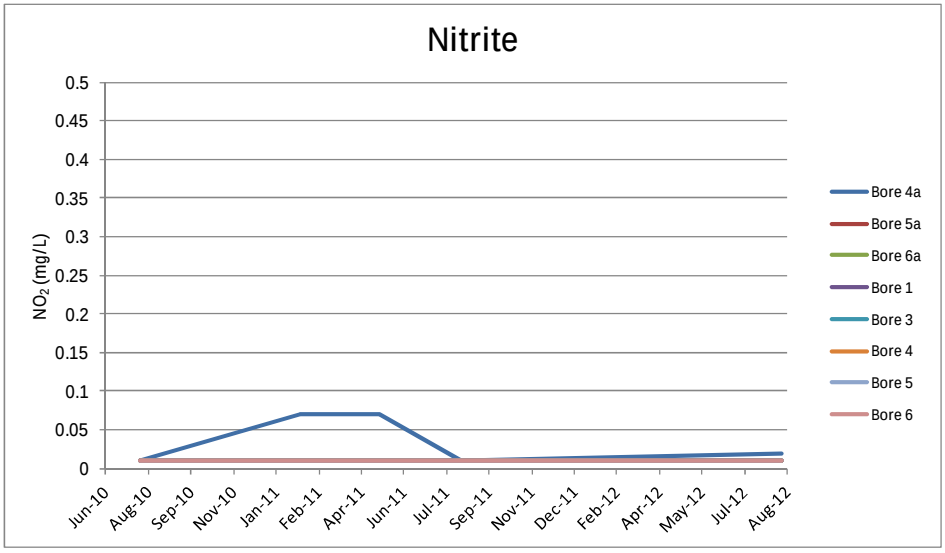
Mercury was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Nitrate results presentation



The ***2011 Australian Drinking Water Guidelines 6*** states that a maximum of 50 mg/L of nitrate is safe for consumption. Denitrification is a process common in leachate treatment where the anaerobic biological reduction of nitrate (NO_3) to nitrogen (N_2) in its gaseous form occurs. Under anoxic conditions microorganisms consume the oxygen in the nitrate and liberate the nitrogen. The relatively low levels of nitrate sampled, indicate that the denitrification process is not evident and landfill leachate is not present in the groundwater.

Nitrite results presentation



Nitrification is a twostep aerobic biological process where bacteria known as nitrosomonas convert ammonia and ammonium to nitrite. Next, bacteria called nitrobacter finish the conversion of nitrite to nitrate. The conversion of nitrite to nitrate is generally very fast and nitrite levels are therefore invariably quite low. More toxic than nitrate, nitrite is an indicator of ammonia (major constituent of landfill leachate) that has not been biologically processed (into nitrate). Nitrite levels above 3 mg/L are considered potentially harmful by the ***2011 Australian Drinking Water Guidelines 6***. As demonstrated by the above data presentation, nitrite levels found in the ground water monitoring wells are extremely small and below detectable limits in 90% of the samples taken.

Organochlorine Pesticides results presentation

Organochlorine pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Organophosphate Pesticides results presentation

Organophosphate pesticides were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Polycyclic Aromatic Hydrocarbons results presenatation

Polycyclic aromatic hydrocarbons were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Toluene results presentation

Toluene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Total Petroleum Hydrocarbons results presentation

Total petroleum hydrocarbons were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile

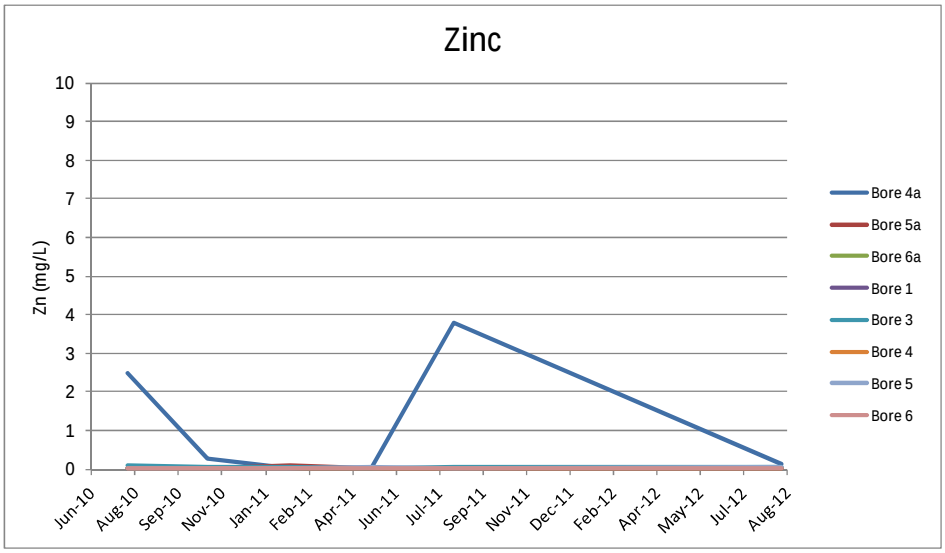
Total Phenolics results presentation

Total phenolics were not detected at any level in the ground water monitoring wells during the reporting period and have never been detected at any quantity. Therefore historical comparison is futile.

Xylene results presentation

Xylene was not detected at any level in the ground water monitoring wells during the reporting period and has never been detected at any quantity. Therefore historical comparison is futile.

Zinc results presentation



The ***2011 Australian Drinking Water Guidelines 6*** states that for aesthetic reasons a maximum of 3 mg/L of zinc is desirable for consumption. Landfill sites can be an anthropogenic source of zinc in groundwater, however the extremely low levels of zinc detected indicate that landfill leachate is not intercepting the groundwater system around the site. The relatively high result indicated in Bore 4a in August 2011 subsequently returned to below detectable limits in August 2012.

3.1.4 Groundwater Testing Results Interpretation

Results indicate that there has been no definitive increase in concentration levels for any of the analytes detailed when compared to the historical results and trends. The following table indicates the analytes that should be closely monitored for developing trends over the next twelve months:

Analyte	Bore Number	Regime	Next Sample
Nitrogen (Ammonia)	4a	Quarterly	August 2013
Potassium	4	Quarterly	August 2013
Total Organic Carbon	3	Quarterly	August 2013
Aluminium	5	Annual	August 2013
Manganese	1, 5, 6	Annual	August 2013

On reflection, key indicators of landfill leachate's potential ingress into ground water including ammonia, nitrate, nitrite levels and other less poignant indicators as tested do not conclude that that landfill leachate is entering the surrounding ground water system.

3.2 SURFACE WATER MONITORING

3.2.1 Tabulated Results

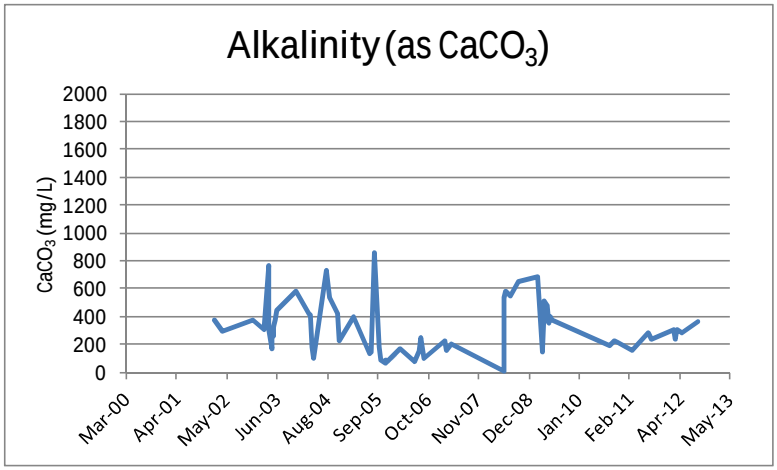
As per the sites EPL, annual sampling and sampling each stormwater overflow event were undertaken with the following results:

Analyte	Sample Date	
	Units	23/08/2012
Alkalinity	mg/L	360
Ammonia	mg/L	1.7
Calcium	mg/L	89
Chloride	mg/L	428
Conductivity	µS/cm	1960
Dissolved O_2	mg/L	5.11
Iron	mg/L	0.18
Fluoride	mg/L	0.7
Magnesium	mg/L	63
Nitrate	mg/L	0.13
Potassium	mg/L	14
Sodium	mg/L	256
Sulfate	mg/L	94
Temperature	°C	16
TP	mg/L	<0.05
TOC	mg/L	5
TSS	mg/L	56
pH	pH	7.3

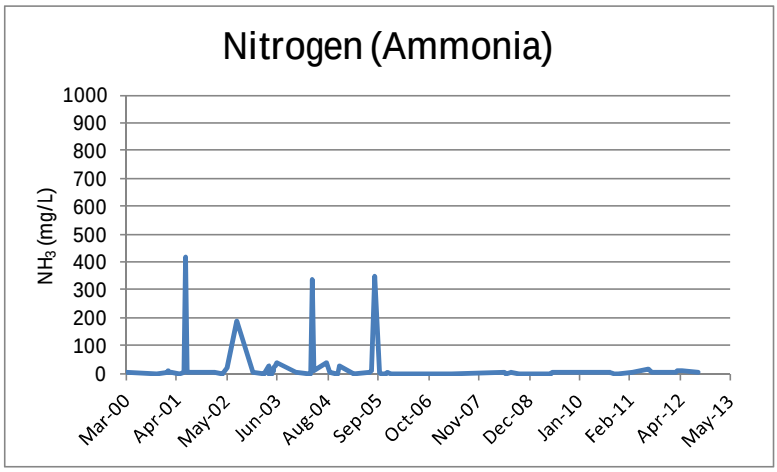
Table 3.2.1 Stormwater overflow monitoring results for the reporting period

3.2.2 Data Presentation

Alkalinity results presentation.

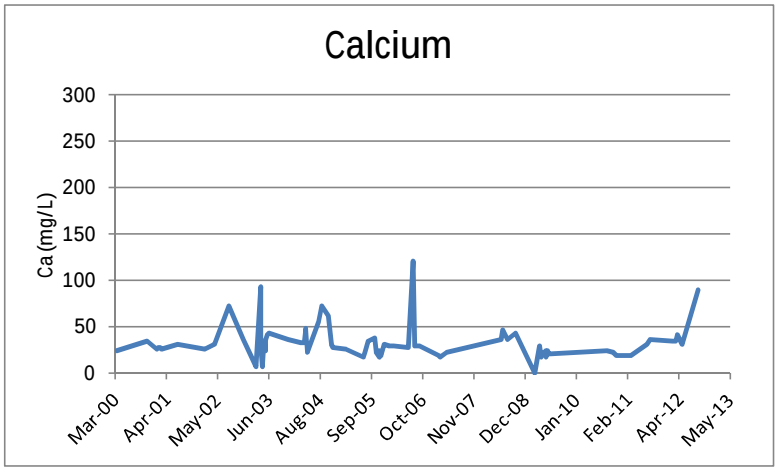


Ammonia results presentation

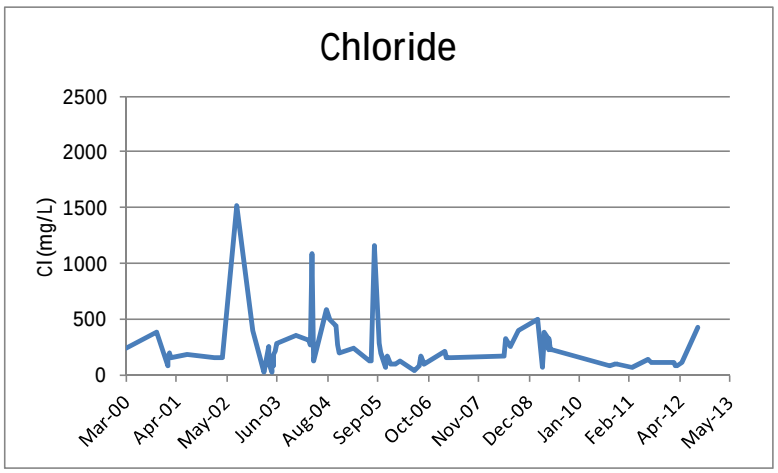


Increased alkalinity and ammonia levels can be caused by biological reactions in landfill leachate. The stability of results, particularly in regard to the reporting period indicates that leachate does not appear to be affecting the stormwater pond. The relatively high alkalinity levels coincide with natural groundwater levels in the area.

Calcium results presentation

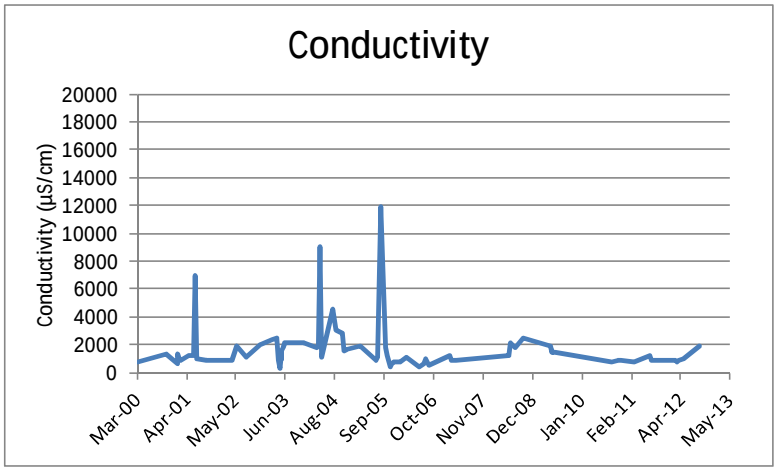


Chloride results presentation

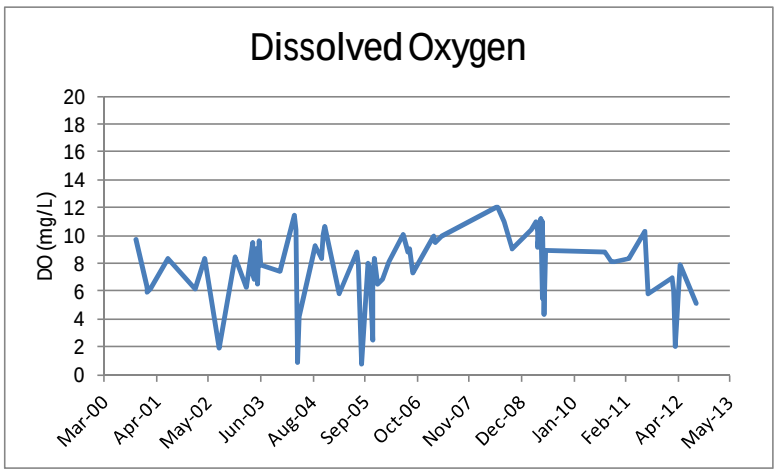


The calcium and chloride levels in the stormwater pond are invariably better than historical results. The levels sampled are also in line with the results sampled throughout the surrounding groundwater system.

Conductivity results presentation

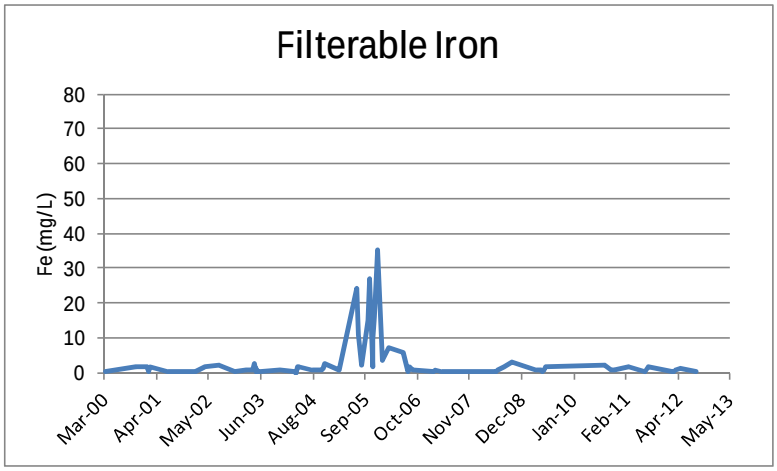


Dissolved oxygen results presentation

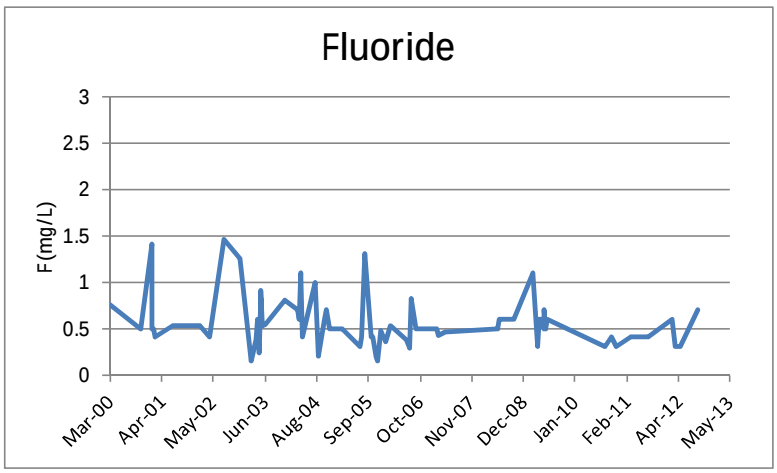


Conductivity is a measure of the waters ability to pass electrical current, usually though positively or negatively charged inorganic dissolved solids (e.g. sodium, magnesium, calcium, iron). The conductivity results for the stormwater detention pond have been stable and trending downwards. Dissolved oxygen levels can be depleted by biological activity associated with the nitrification process. The dissolved oxygen levels have been stable over the history of available results with around 8mg/L of variation over the twelve year sampling period.

Filterable iron results presentation



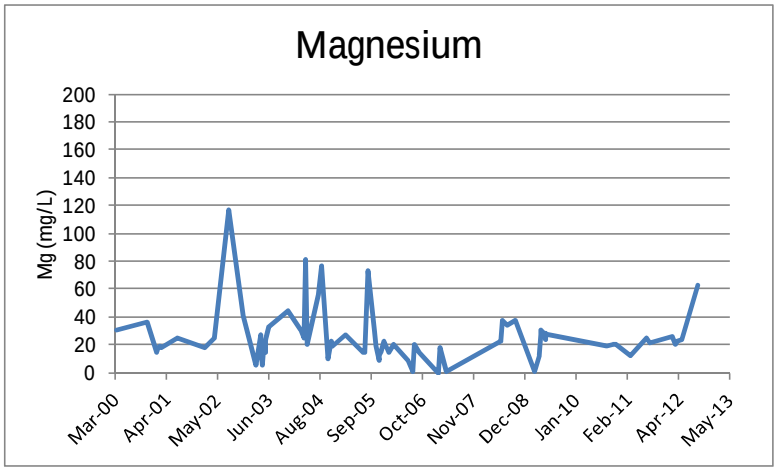
Fluoride results presentation



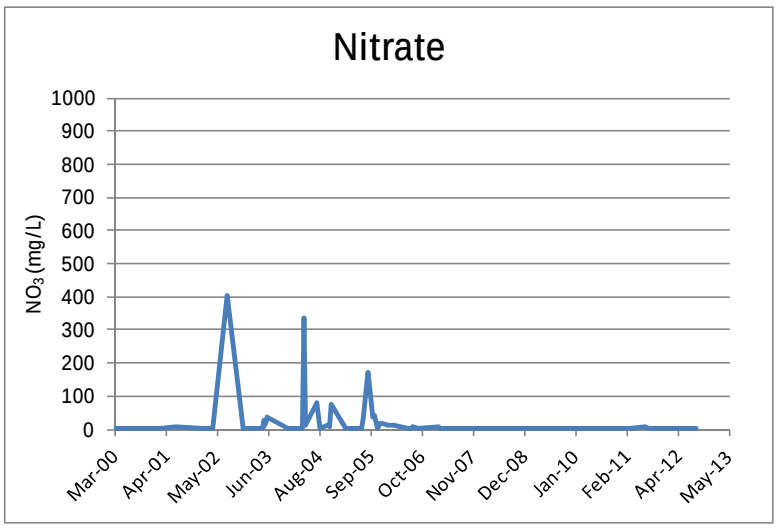
Filterable iron and fluoride have continued to trend at very low levels, especially with regard to the reporting period.

Fluoride occurs in Australian drinking water at levels up to 1.5 mg/L. The level of fluoride found in the stormwater detention pond is therefore relatively low and displays a consistent trend over the twelve year sampling period.

Magnesium results presentation

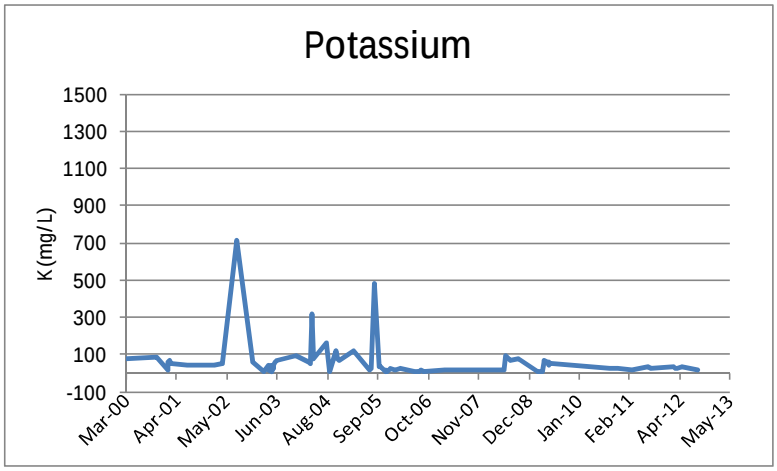


Nitrate results presentation

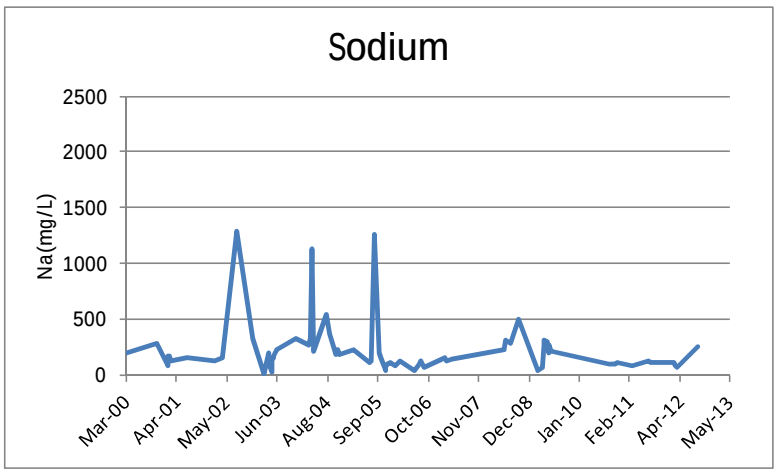


The ***2011 Australian Drinking Water Guidelines 6*** states that a maximum of 50 mg/L of nitrate is safe for consumption, whilst magnesium is considered as "soft" in the range of 0-60 mg/L. The relatively low levels of nitrate and magnesium sampled indicate that landfill leachate is probably not present in the stormwater detention pond.

Potassium results presentation

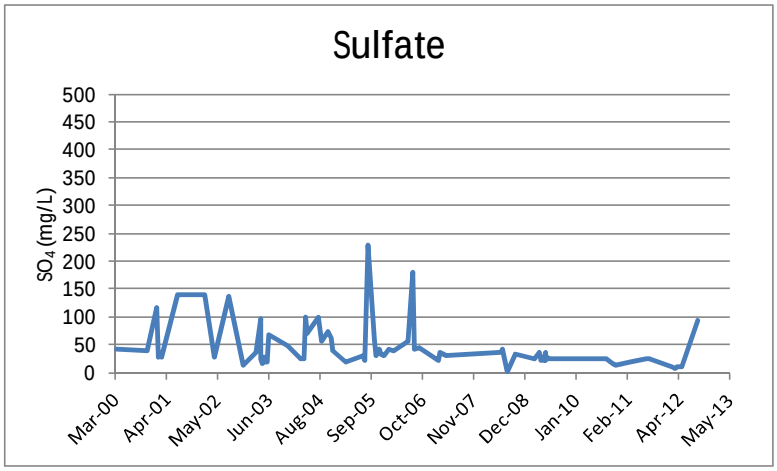


Sodium results presentation



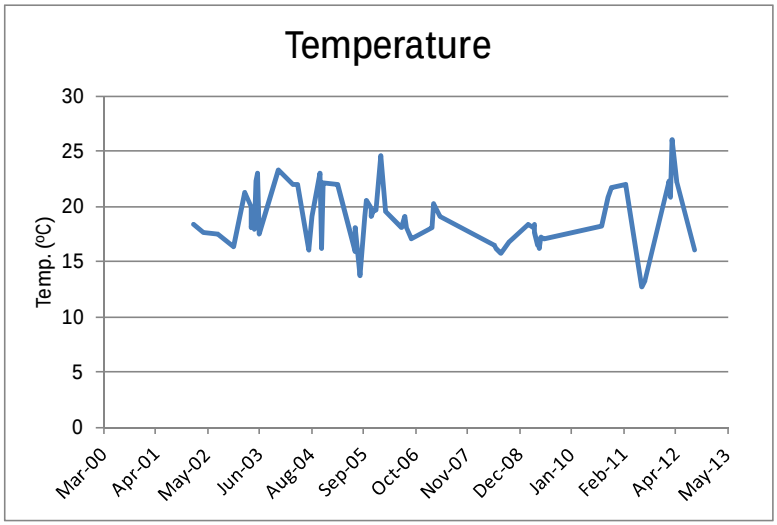
Potassium and sodium concentrations have been in line with recent trends and with the naturally occurring groundwater levels of these analytes around the site. Both analytes have trended downwards in recent years.

Sulfate results presentation



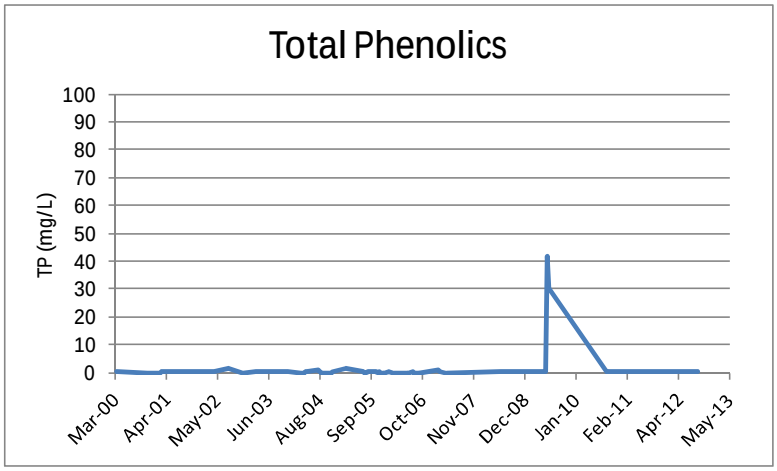
The ***2011 Australian Drinking Water Guidelines 6*** sets maximum sulfate levels in drinking water as 500 mg/L. The sulfate levels in the stormwater detention pond are in line with the historical levels and are better than the drinkable water standard. Inorganic ions such as sulfate provide a potential indicator of groundwater contamination by landfill leachate. A sudden increase in these ions can act as early warning system.

Temperature results presentation



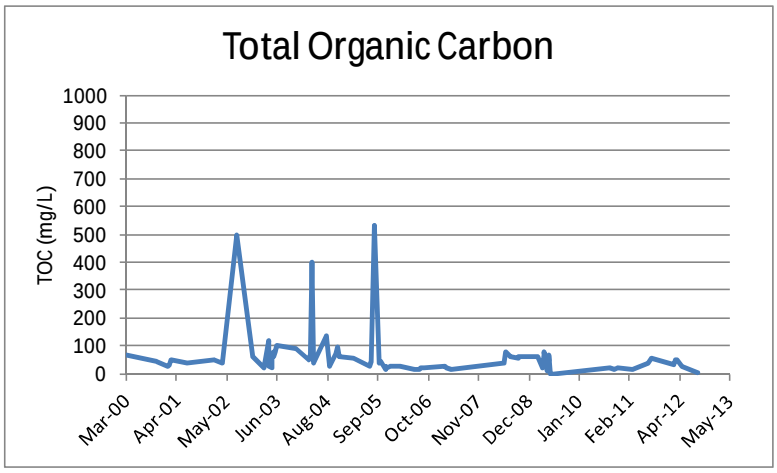
Temperature, as expected has generally been indicative of the season in which the stormwater detention pond has been sampled.

Total phenolics results presentation



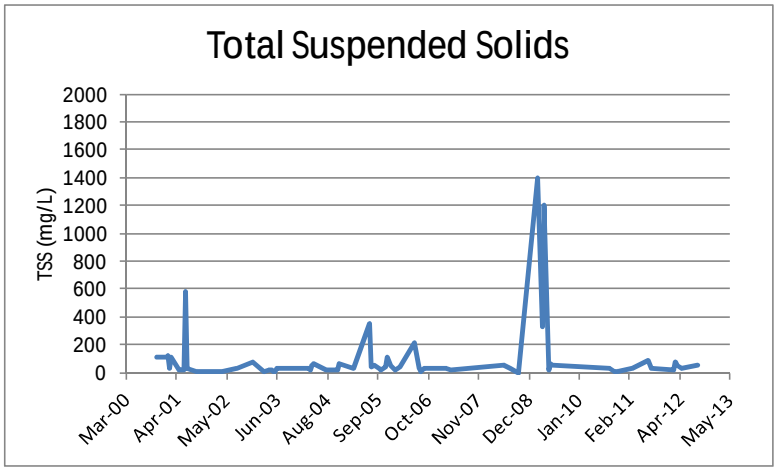
Total phenols are widely used in the manufacture of resins, plastics, insecticides, explosives, dyes, and detergents. It is also used as a raw material for the production of medicinal drugs such as aspirin. Historical results for total phenols have been extremely low and more often than not, below detectable limits in the stormwater detention pond. In fact, all samples taken during the reporting period were below detectable limits.

Total organic carbon results presentation

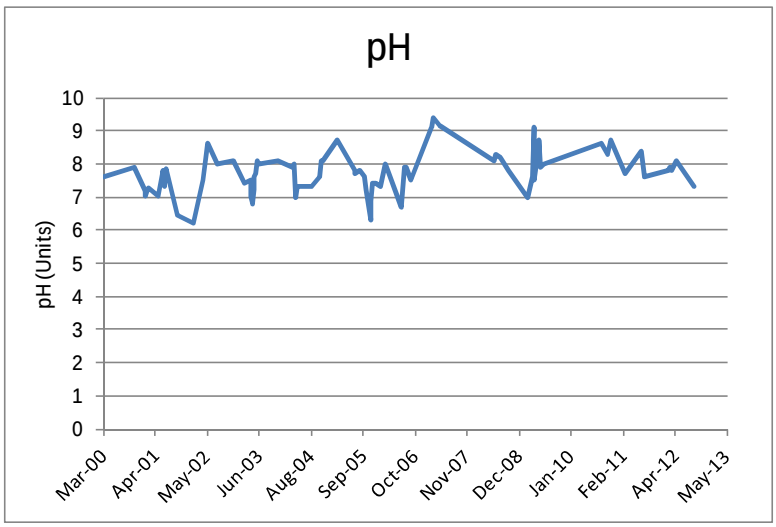


Microbial degradation of organic matter can increase the total organic carbon content in water and may provide evidence of water contamination by natural compounds derived from the landfilling of organic matter. The amount of total organic carbon has remained consistently stable over the last 8 years.

Total suspended solids results presentation



pH results presentation



The detention pond analytes measured at the site show relatively low levels of suspended solids and consistent pH levels in the surface water. The suspended solids levels were somewhat inconsistent in the 2008-2010 period, with the amount of solids suspended in the stormwater fluctuating. More modern results indicate that the stormwater pond is functioning effectively.

3.2.3 Surface Water Results Interpretation

From the analytical results it can be demonstrated that the sites sediment and stormwater pond infrastructure are performing adequately and as desired.

3.3 AIR EMISSIONS MONITORING

3.3.1 Tabulated Results

Date	Results Above Recommended Threshold 500ppm	Accumulation Above Recommended Threshold 1250ppm
Jun-12	2	0
Jul-12	2	0
Aug-12	0	0
Sep-12	0	0
Oct-12	0	0
Nov-12	0	0
Dec-12	0	0
Jan-13	0	0
Feb-13	1	0
Mar-13	0	0
Apr-13	0	0
May-13	0	0

Table 3.3.1 Methane monitoring results for the reporting period

Presented results are the number of individual sample results derived from monthly testing that are above the EPA Benchmark Technique recommended threshold levels for further action regarding surface emissions (500 ppm) and accumulation levels (1,250 ppm).

3.3.2 Data Presentation

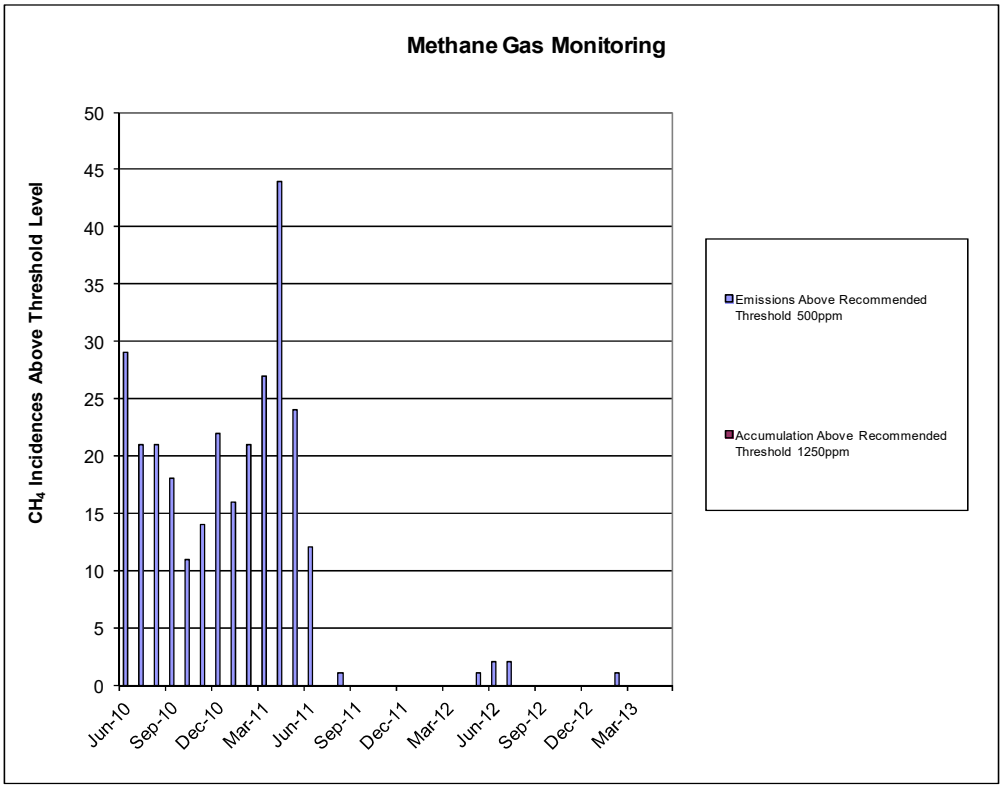


Figure 3.3.2 Air emissions test results above benchmark recommended threshold levels presentation

There is no evident trend for methane gas emissions from the landfill surface. No accumulation levels above the recommended benchmark threshold were found.

3.3.3 Air Emissions Monitoring Results Interpretation

Prior to the preceding reporting period (2011-2012) results sampled by GHD showed continued occurrences of surface methane emissions above the EPA recommended threshold levels. A more recent contract awarded to a NATA approved laboratory (ALS Environmental) has shown that the GHD recorded levels were potentially overstated. Both companies state that the accumulation monitoring clearly shows that the methane is not migrating offsite.

Despite the differences in sample results, the site clearly generates relatively high amounts of landfill gas, namely methane that must be dealt with. Accordingly, Council commenced installation of methane gas extraction infrastructure. In fact, Phase 1 of the landfill gas management is in place and connected to a flaring unit. Phase 2 is currently progressing to tender and will more than double the landfill area captured by the gas extraction system and will lead to power generation (as well as flaring of the methane gas). The Phase 3 gas collection system will coincide with waste filling of the new landfill cell at the WWARRP.

It should be noted that Council has not attempted to rehabilitate the areas prone to surface gas emissions as it would increase the possibility of those some what controlled emissions finding a new path of least resistance and becoming uncontrolled.

3.4 ENVIRONMENTAL COMPLAINTS

3.4.1 Tabulated Results

Year	Environmental Complaints
2000/2001	0
2001/2002	99
2002/2003	66
2003/2004	19
2004/2005	36
2005/2006	19
2006/2007	22
2007/2008	21
2008/2009	9
2009/2010	12
2010/2011	12
2011/2012	48
2012/2013	59

Table 3.4.1 Tabulated complaints for the reporting period and historically

3.4.2 Data Presentation

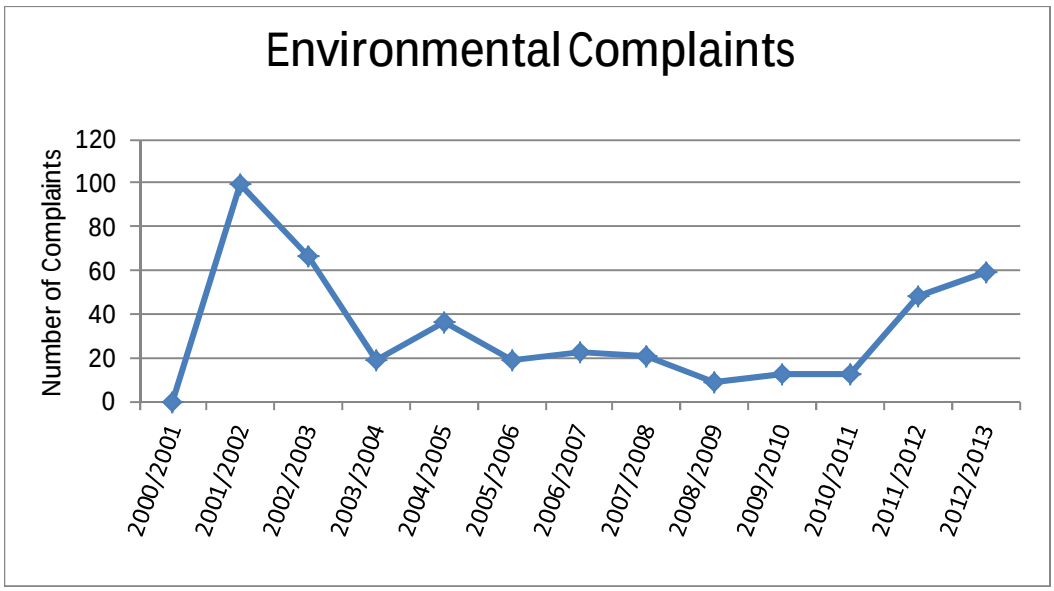
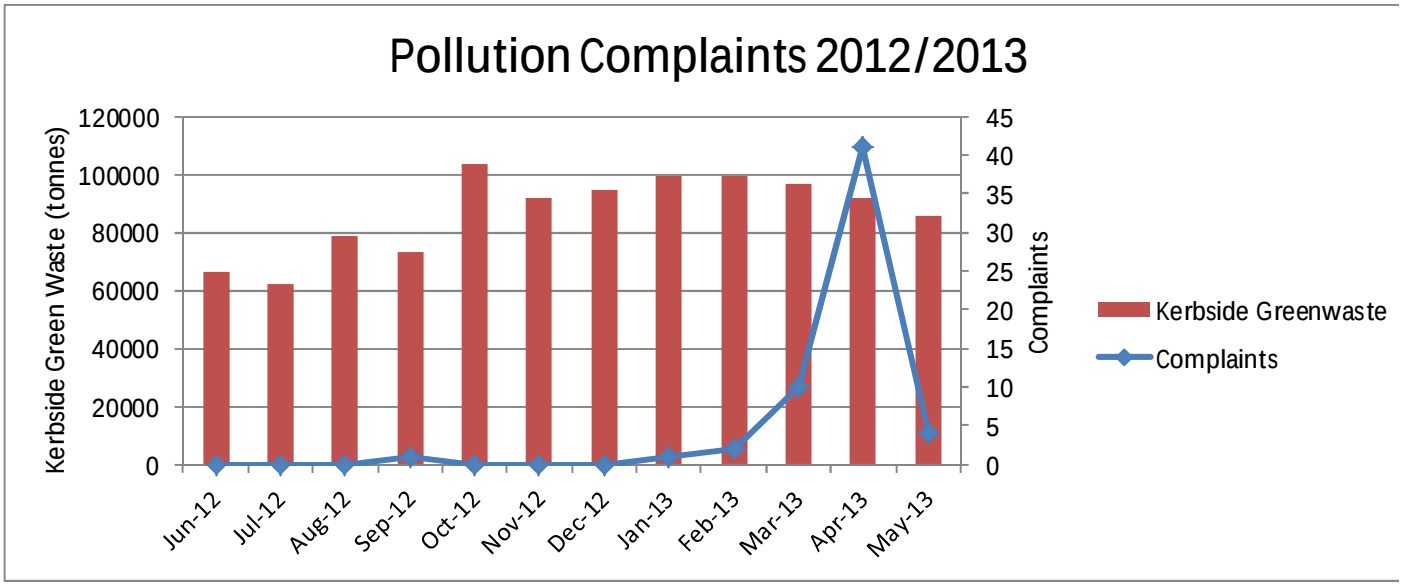


Figure 3.4.2 Environmental complaints results.

Environmental complaints have generally trended downwards until the subsequent two reporting periods where a significant spike has occurred.

3.4.3 Environmental Complaints Results Interpretation

The overlying trend for environmental complaints had been downward after closure of the solid waste energy recovery facility in 2004. However, the previous two reporting periods have given rise to a spike of over 100 complaints, invariably regarding perceived odour from the WWARRP.



Period of processing site shutdowns

As detailed in the above chart, the complaints were received generally during the autumn season after 6 months of high kerbside green waste received tonnages. The green waste was not received at the WWARRP during the reporting period and was instead received at a nearby site also located on Reddalls Road at Kembla Grange. It should be duly noted that the green waste processing site recorded shut downs in February and March 2013 and as a result created a lag in green waste processing and excessive stockpiles of decomposing material was stored on the site.

Complaints received during autumn 2013 were directed to Council and only upon follow up with each individual resident was Council able to conclude that the vast majority did not know about other processing facilities on Reddalls Road at Kembla Grange. It should be noted that the majority of residents opined that as a whole Council is still responsible for ensuring odour in its governance area is minimised.

Therefore, it is the conclusion of this report that the preponderance of odour complaints received during the reporting period were not necessarily aimed at the performance of the WWARRP, but rather aimed at Council from a governance of the Environmental Planning and Assessment Act compliance perspective.

4 SITE SUMMATION

4.1 DEFICIENCY IDENTIFICATION & REMEDIATION

4.1.1 Surface Methane Emissions above Recommended Benchmark Threshold Levels

As discussed in Section 3.3.3, the site has historically possessed some previously landfilled areas that emit methane gas above the EPA's recommended benchmark level for further investigation into surface gas emissions. Council has not attempted to cap these areas so that the peak emissions locations are identified and so that the possibility of offsite migration is nullified. Council has trialled a biofiltration type system to attempt to reduce the methane emissions from identified peak areas. However, in February 2013 Council commenced installation of a gas extraction system. The gas management system and its future developments are expected to address the gas emission issues that have arisen from time to time at the WWARRP.

4.1.2 Boreholes Indicating Potentially Imperfect Trend Stability

As discussed in Section 3.1.4, seven borehole locations have provided individual and incidental analytical results that require an increased level of scrutiny upon future measurements to ensure negative trends are not establishing. Whilst it is common for individual analytical results to vary from time to time, the prudent course of action is to provide an increased level of vigilance for these analyte and borehole combinations until such time the results return to historic levels or further action is required.

4.1.3 Dry Boreholes

During the current and previous sampling periods, several boreholes (namely, MW1A, MW2A, MW3A and MW7A) have developed into dry boreholes. To rectify this, Council in association with Golder Associates and the EPA have developed a new groundwater monitoring regime with many new boreholes that collectively replaces the regime detailed in this report. It is anticipated that the next reporting period will have a far more modern and suitable groundwater monitoring regime that will rectify the dry boreholes issue and provide far more relevant results for site investigations and future actions.

4.2 CONCLUSION

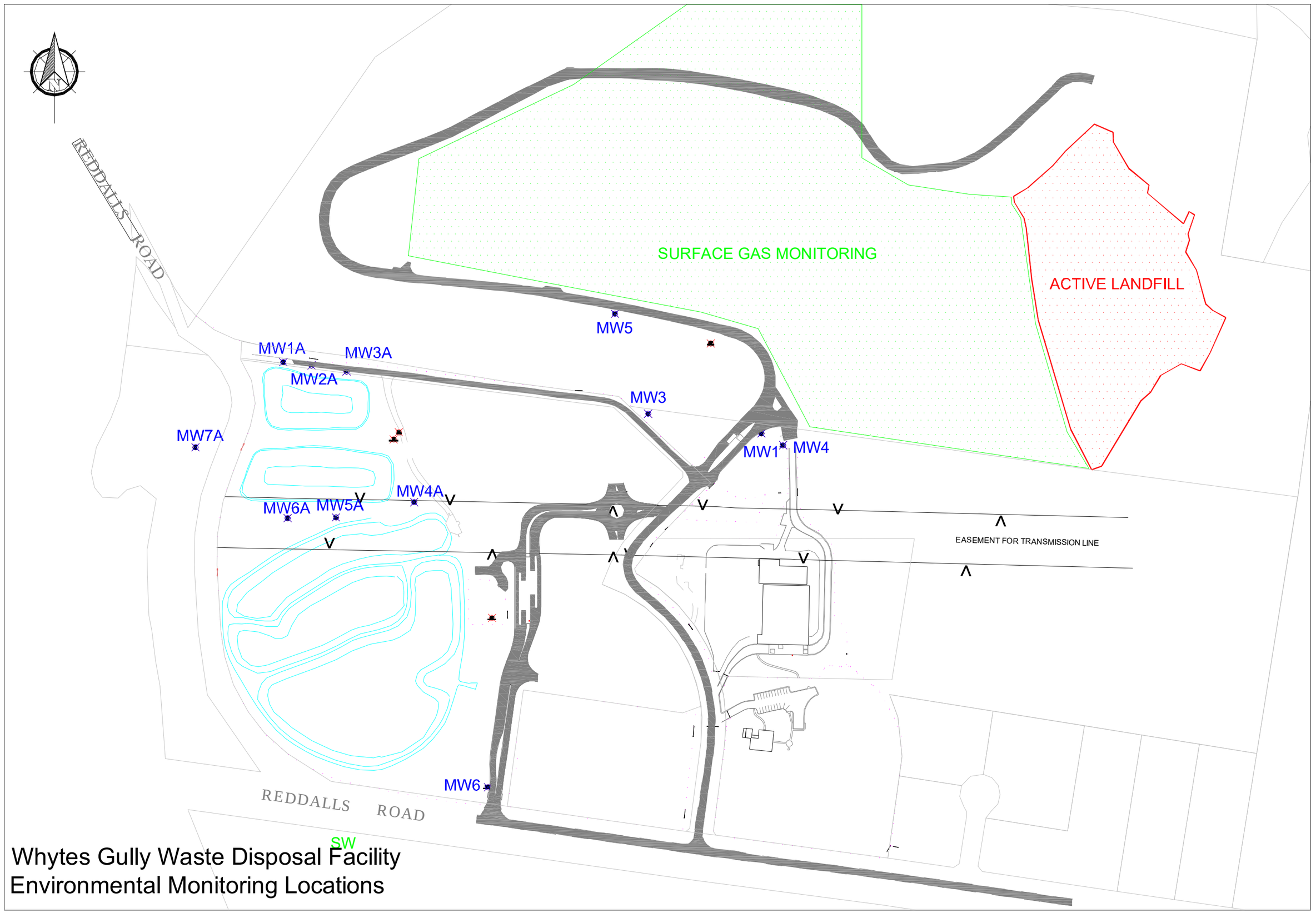
The site is performing well within the individual criteria and limits assigned to it in regard to environmental performance. The low number of deficiencies and nil non compliances in conjunction with the continued downward trend of environmental complaints shows that Council has maintained satisfactory environmental performance. Actions have already commenced to improve the sites performance in regard to the identified deficiency in Section 4.1.1, which will ensure Council's goal of continuous environmental improvement at Whytes Gully is achieved.

Further, modernised test regimes to be implemented in the next reporting period alongside the planned new cell development will provide a far better reflection of the state of the environment affected by the site. Consequently, environmental performance trend analysis and analytical results with be more pertinent as the new cell develops.

Annexure A

A Environmental Monitoring Locations

Environmental Monitoring Locations



Whytes Gully Waste Disposal Facility
Environmental Monitoring Locations

Project Approval MP11_0094

APPENDIX

D

INDEPENDENT ENVIRONMENTAL AUDIT 2018

Independent Environmental Audit (IEA)
Whytes Gully Landfill Extension Project

for Wollongong City Council

Reddalls Road, Kembla Grange, NSW

MCW Environmental Consulting Pty Ltd

March 2018

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Report Title	**Independent Environmental Audit 2017** **Whytes Gully Landfill Extension Project**
Client	**Wollongong City Council** **Reddalls Road, Kembla Grange, NSW**
Report Reference	**MCW_Environmental_Whytes Gully Landfill_IEA_2017_Final_Rev0**
Status	**Final**
Issue Date	**29 March 2018**

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Abbreviations

Abbreviation	Description
AQMP	Air Quality Management Plan
ANZECC	Australian and New Zealand Environment and Conservation Council
CCC	Community Consultative Committee
CoA	Condition of Approval
Council	Wollongong City Council
DA	Development Application
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning and Environment
Director-General	Director-General of Department of Planning, or delegate
EIS	Environmental Impact Statement
EC	Electrical Conductivity
EEC	Endangered Ecological Community, as defined under the NSW *Threatened Species Conservation Act 1995*
Environmental consequences	Environmental consequences of Subsidence Impacts, including: damage to infrastructure, buildings and residential dwellings; loss of surface flows to the subsurface; loss of standing pools; adverse water quality impacts; development of iron bacterial mats; cliff falls; rock falls; damage to Aboriginal heritage sites; impacts on aquatic ecology, ponding etc.
EMP	Environmental Management Plan
EMS	Environmental Management System
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
IEA	Independent Environmental Audit
INP	Industrial Noise Policy
Land	Land means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Minister	Minister for Planning, or delegate
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
NMP	Noise Monitoring Program
NOW	NSW Office of Water (adopted certain responsibilities of DWE from July 2009)
OEH	Office of Environment and Heritage (formerly Department of Environment, Climate Change and Water (DECCW))
Privately owned land	Land that is not owned by a public agency, or a mining company (or its subsidiary).
PA	Project Approval
Project	The development as described in the EA
REF	Review of Environmental Factors
RMS	Roads and Maritime Services
SEE	Statement of Environmental Effects
Site	Lands described in Schedule 1 of the Project Approval 11_0094
SoC	Statement of Commitments The Proponent's commitments in Appendix 1
TSS	Total Suspended Solids
WGLEP	Whytes Gully Landfill Extension Project
WGRRP	Whytes Gully Resource Recovery Park

Executive Summary

MCW Environmental Consulting Pty Ltd (MCW Environmental) was engaged by Wollongong City Council (WCC) to conduct an Independent Environmental Audit (IEA) of the Whytes Gully Landfill Extension Project (WGLEP) (The Project) at Whytes Gully Resource Recovery Park (WGRRP), Reddalls Road Kembla Grange, NSW.

The IEA was conducted as required under the Condition 9 of Schedule 5 of the project approval 11_0094. The approved landfill project will provide approximately six million cubic metres of additional landfill capacity at WWARRP. The overall project will consist of the following key components:

- New landfill cell construction (Stage 1A, 1B, 2A, 2B, 3 and 4)
- New landfill cell operation (Stage 1A, 1B, 2A, 2B, 3 and 4)
- Progressive landfill rehabilitation and revegetation of the finished landform
- Surface water drains and surface water ponds
- Leachate management infrastructure and ponds
- Landfill gas extraction and flaring
- Demolition of existing buildings, construction of temporary and permanent roads.

The IEA process was based on Post Approval Guidelines – Independent Audits (DPE, 2015), the auditing standard AS/NZS ISO 19011:2014 and MCW Environmental's proposal to conduct the work dated July 2017. This is the first IEA undertaken at the Project.

The IEA consisted of a detailed desktop review of documents supporting compliance, interviews with Wollongong City Council (WCC) staff and site inspections of the Project area in September and November 2018.

The audit included consultation with the following government agencies: NSW Department of Planning and Environment, (DPE) NSW Environmental Protection Agency (EPA), Roads and Maritime Services (RMS) and WCC.

The period of the IEA was from the date of the Project Approval (3 April 2013) to 11 September 2017, with a focus on recent years (2015 onwards). The first day of the site visit of this IEA was on 11 September 2017 and second day on 27 November 2017.

The Independent Environmental Audit assessed compliance with relevant approvals, licences and management plans applicable to the Project. Detailed compliance registers identifying audit findings, comments and recommendations are presented in **Appendix A and B**. Non-compliances identified against relevant approvals are identified and discussed in Section 8.

In addition the scope of the audit included a review of the adequacy of the strategies, plans and programs required under the Development Approval. The findings of the adequacy review of management plans and systems is presented in Sections 7. Continuous improvement opportunities were identified and are presented throughout the report.

A summary of recommended actions to improve environmental performance and compliance status is presented in Section 8.

1 Introduction

1.1 Background

MCW Environmental Consulting Pty Ltd (MCW Environmental) was engaged by Wollongong City Council (WCC, through Golder Associates) to conduct an Independent Environmental Audit (IEA) of the Whytes Gully Landfill Extension Project (WGLEP) (The Project) at Whytes Gully Resource Recovery Park (WGRRP), Reddalls Road Kembla Grange, NSW.

The IEA was conducted to address the requirements of the Minister's Condition of Approval 11_0094 (MCoA) for Whytes Gully Landfill Extension Project.

This is the first IEA undertaken at the Whytes Gully Landfill Extension Project in accordance with Minister's Condition of Approval 11_0094 (Appendix A).

MCW Environmental were commissioned and contracted by Golder Associates on behalf of WCC to undertake the IEA.

1.2 Audit Scope

The audit was conducted in accordance with the requirements set out in WCC Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094 as detailed in **Table 1-1**. The audit period was from the date of the Project Approval (3 April 2013) to 11 September 2017, with a focus on recent years (2015 onwards).

Table 1-1 - Scope of Work

Project Approval Condition	Requirement	Where Addressed in this Report
Sch 5 Condition 9	Within a year of the commencement of operation of the project, and every 5 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the Project. This audit must:	Section 2.1
Sch 5 Condition 9 (a)	be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;	Section 2.2 Appendix E
Sch 5 Condition 9 (b)	include consultation with the relevant agencies;	Section 3 Appendix C
Sch 5 Condition 9 (c)	assess the environmental performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL (including any plan or program required under these approvals);	Section 5; Section 6 Appendix A and Appendix B
Sch 5 Condition 9 (d)	review the adequacy of any plans or programs required under these approvals; and, if appropriate;	Section 4
Sch 5 Condition 9 (e)	recommend measures or actions to improve the environmental performance of the Project, and/or any plan or program required under these approvals; and	Section 5
Sch 5 Condition 9 (f)	be placed on Council's website within 2 weeks of its completion.	Section 2.8.3

Project Approval Condition	Requirement	Where Addressed in this Report
Sch 5 Condition 10	Within 6 weeks of the completing of this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.	Section 2.8.3

The following lots are covered under the MCoA and the EPL premise map, however were not included in the scope of this audit as they were reported by WCC to be not part of Whytes Gully Landfill Extension Project and hence specifically requested by WCC to not be included in the audit:

- Lot 52 DP 1022266 which is leased by Visy Recycling (not under the control of WCC)
- Lot 51 DP 1022266 which was noted not to be under Whytes Gully Landfill management.

This is further discussed in Appendix A (Condition 2 Schedule 3).

The audit scope did not include a detailed and comprehensive review of the implementation of the LEMP and its subplans, however, comments relevant to the LEMP and compliance with the Project Approval conditions are provided in Appendix A and B.

Further, there are a number of specialist and technical reports referred to in this document relating to specific areas of management of Landfills. MCW Environmental has not completed any technical review of these documents as part of this audit.

1.2.1 Audit Methodology

This Independent Environmental Audit (IEA) is conducted for Wollongong City Council for Whyte Gully Landfill Extension Project (WGLEP) in compliance with Condition 9; Schedule 5 of MCoA as detailed above.

The IEA was undertaken in general accordance with:

- Post Approval Guidelines: Independent Audits (NSW Government, 2015);
- AS/NZS ISO 19011:2014 Guidelines for auditing management systems; and
- MCW Environmental's proposal (dated 7 July 2017).

The IEA methodology included:

- Opening meeting with WCC management to discuss the approach and process of the IEA;
- Consultation with the following key government agencies on WGLEP environmental performance:
    - NSW Department of Planning and Environment (DPE);
    - NSW Environment Protection Authority (EPA);
    - Office of Environment and Heritage (OEH); and
    - Roads and Maritime Services (RMS);
- Preparation of compliance assessment checklists for the regulatory approvals and licence listed in **Table 2-1**;
- Site inspections – two site inspections were conducted: the first on 11 September 2017 (review of operations activities) and the second on 27 November 2017 (review of construction activities). The weather on the first inspection was clear, still and sunny. The weather on the second inspection was windy and overcast. Interviews were conducted during the site inspections with WCC representatives as listed in Section 1.4.
- Review of documentation and interviews with site personnel and contractors;
- A review of environmental management performance including reviews of:
    - Landfill Environmental Management Plan;
    - Construction Environmental Management Plan Framework;

  - Environmental management procedures;
  - Standard operation procedures;
  - Annual Returns;
  - Non-compliance reports; and
  - Incidents and complaints.
- An assessment of compliance was undertaken for each condition within the regulatory approvals listed in T**able 2-1** based on a review of documentation made available, observations during site inspections, interviews, implementation of management and monitoring plans, incidents, complaints and regulatory action.
- Provision of recommendations for each non-compliance and for conditions that were assessed as compliant and where there was opportunity for continual improvement, an Opportunity for Improvement (OFI) was provided.
- Provision of a draft IEA report to WCC to provide an opportunity to provide additional information and /or correct errors in fact; and finalisation of the IEA report.

It is the responsibility of WCC to place the IEA Report on the WCC website and provide responses to the recommendations in the report.

1.3 Documents Reviewed

The following information was reviewed during the audit process:

- Project Approval 11_0094;
- EPL No. 5862;
- Sydney Water Trade Waste Agreement 11205;
- Management Plans as provided by Golders and WCC;
- Site environmental plans, procedures and checklists;
- Selected records of competency, induction and training;
- Selected meeting minutes;
- Selected reports; and
- Evidence of selected monitoring data and review.

Documents sighted during the audit are referenced as part of the text discussing compliance status in **Appendix A and Appendix B**.

1.4 Personnel and Timing

The IEA was conducted by the following qualified, experienced and independent auditors:

- Michael Woolley, Lead Auditor (MCW Environmental); and
- Annabelle Tungol Reyes, Auditor (Healthy Buildings International Pty Ltd (HBI)).

Michael Woolley is registered by Exemplar Global (formerly RABQSA) as a Certified Lead Auditor for Environmental Management, Site Contamination Assessment and Compliance Auditing.

Annabelle Tungol Reyes is also registered by Exemplar Global as Lead Auditor for Environmental Management Systems (EMS), Environmental Report Verification, Compliance Audit, and ISO14001:2015 Audit.

The auditors were approved by the Secretary in a letter dated 27 July 2017.

Personnel responsible for the management at WGLEP were interviewed during the site visit included the following:

- Sandra Belansky, Waste Operations Manager (left WCC in early November 2018);

- Joel Coulton, Waste Operations Manager (from February 2018)
- Wayde Peterson, Waste Services Manager; and
- Benjamin Hardaker, Senior Project Manager.

1.5 Format of Report

The format of this report is as follows:

- Section 1 is introductory and defines the scope and nature of the audit;
- Section 2 describes Whytes Gully landfill operations as observed during the site inspection;
- Section 3 summarises the consultation with key regulatory agencies and stakeholders;
- Section 4 provides an assessment of the environmental performance of the development and its effects on the surrounding environment;
- Section 5 provides a summary of photographs from the site inspection.
- Section 6 describes the approach to the assessment against the relevant standards, performance measures and statutory requirements;
- Section 7 presents the findings of the review of the adequacy of the Environmental Management Strategy and environmental management and monitoring plans
- Section 8 summarises the non-compliances and recommendations made throughout the report.
- Section 9 provides the limitations of the report.

Appendix A is a tabulated review of the results of the assessment of compliance with the Conditions of Approval (CoA) and Statement of Commitments (SoCs) of PA 11_0094. **Appendix B** is a tabulated review of compliance with Environmental Protection Licence 5862.

2 Whytes Gully Landfill Operations

2.1 Site Description

2.1.1 Regional Setting

The Wollongong Local Government Area (LGA) is located 80 kilometres south of Sydney. Wollongong LGA is bordered by the Royal National Park to the north, Lake Illawarra to the south, the Tasman Sea to the east and the Illawarra escarpment to the west.

Whytes Gully Resource Recovery Park (WGRRP) is located approximately 10km to the south west of the Wollongong CBD and is approximately 65 ha in size.

2.1.2 Site Location

The site is located approximately 10 km to the south west of Wollongong Central Business District, on Reddalls Road, Kembla Grange, and within the Wollongong City Council LGA.

The WGRRP is located on the Reddalls Road, Kembla Grange NSW. The site is generally bounded by Reddalls Road to the south and west, rural residential lands to the north, north-east and north-west, and a water treatment plant to the south east. An industrial area including large car storage and parking facilities lies to the south of Reddalls Road and Dapto Creek lies to the west.

2.1.3 Site Ownership, Zoning and Tenure Details

The WGRRP is owned by Wollongong City Council and consists of:

- Part Lot 501, DP 1079122;
- Lot 502, DP 1079122;
- Lot 2, DP 240557;
- Lot 52, DP 1022266;
- Lot 53, DP 1022266; and
- Lot 51, DP 1022266.

The land is zoned as IN2 Light Industrial under the Wollongong Local Environmental Plan (West Dapto) 2010 (LEP).

2.1.4 Surrounding Land uses

The surrounding zoning and land uses are as follows:

- To the north and north east is zoned E1 and E2 to predominantly to identify and protect escarpment area.
- To the north west and west is zoned RU2 (Rural Landscape). Isolated residential properties are also scattered through this zoning.
- To the west is zoned IN3 (Heavy Industrial). Use is generally low intensity light industrial.
- To the east is zoned IN2 (Light Industrial) Land.

2.2 Description of Site Operations

2.2.1 Site History and Project Description

The EPA Annual Return (2017) provides the following overview of the site:

"Whytes Gully was developed in the early 1980's as the principal landfill site for Wollongong's domestic and commercial waste streams. Initially, the 'western gully' section was landfilled. The western gully is unlined by modern standards and was used from 1982 to 1993. Initially coal wash refuse was used to provide daily cover, then around 1988/89 steel furnace slag was introduced because of its stability in wet weather and Council's inability to source local clean fill in sufficient

quantities. The leachate collection from the western gully is through a series of rock drains at the centre of each lift. The rock drains connect with a riser and the leachate flows from riser to riser, and then to the leachate collection well at the base of the western gully. The western gully section of the landfill has been capped with clay to varying depths between 1m and 4m.

The 'eastern gully' section development received consent in 1992/93, following extensive public consultation. The eastern gully section is lined with a single layer of HDPE smooth liner, over a subsoil drainage layer of 5mm gravel and a corrugated groundwater drainage system. The eastern gully was excavated to rock and was developed in two stages, beginning with the first stage 80 to 100m above the slope from the current toe of the landfill embankment. The leachate is drained from the first stage of the eastern gully via a 300mm corrugated drainage pipe at the base and a 300mm thick sand layer above the liner.

The second stage of the eastern gully operates in front and above the first stage, with extended leachate drains and HDPE liner. From 2014 to 2016 the eastern gully underwent extensive surface reshaping works in order to reduce rainwater infiltration, increase surface water diversion, ensure consistent cover depths and to prepare the surface for the new landfill cell base liner.

The new stage 3 landfill development commenced with construction below the eastern gully in August 2013, with the first cell 1A completed in 2014. Waste commenced being placed in Cell 1A in March 2015.

Council has since constructed Cell 1B (2015) and commenced filling. Cell 2 is currently being constructed.

Leachate is collected from all landfilled areas at the site and treated in a 3 stage process. The leachate is initially collected in a primary holding pond that uses a biological process and aeration to strip the leachate of ammonia. The leachate is then pumped to a smaller pond with a larger surface area to increase the speed of this process on a batch by batch basis. From the smaller pond the leachate is then pumped to a sequential batch reactor that in conjunction with a filtration system eliminates the residual contaminants in the leachate suitable for acceptance by sewer under the sites Trade Wastewater Agreement with Sydney Water."

2.2.2 Project Approval

Wollongong City Council owns and operates the Whytes Gully Resource Recovery Park (WGRRP), which receives municipal solid waste within the local government area (LGA). As landfill airspace at WGRRP was projected to expire in 2014, Council proposed a staged new landfill cell at this location to cater for projected future landfilling requirements.

In 2012, Council lodged a major project application (project application number 11_0094) for the Whytes Gully New Landfill Cell project under Part 3A of the Environmental Planning and Assessment Act 1997 (EP&A Act).

This included the preparation of an Environmental Assessment (EA) which was submitted to the then NSW Department of Planning & Infrastructure (now NSW Department of Planning and Environment). The EA was exhibited and the community was invited to comment on it from 6 August – 7 September 2012.

The project application was approved on 3 March 2013, subject to conditions. The EA, including the conditions of approval, can be viewed at: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4024.

The approved landfill project is to provide approximately six million cubic metres of additional landfill capacity at WGRRP. The overall project consists of the following key components:

- New landfill cell construction (Stage 1A, 1B, 2A, 2B, 3 and 4)
- New landfill cell operation (Stage 1A, 1B, 2A, 2B, 3 and 4)

- Progressive landfill rehabilitation and revegetation of the finished landform
- Surface water drains and surface water ponds
- Leachate management infrastructure and ponds
- Landfill gas extraction and flaring
- Demolition of existing buildings, construction of temporary and permanent roads

2.2.3 Project Status at time of this IEA

The construction of Package 1 is broken into two stages being Stage 1A and Stage 1B. These works comprise the construction of approximately 10ha of new landfill liner, with associated earthworks and surface water management components, and will provide more than one million cubic metres of landfill storage volume (airspace). This represents roughly 20% to 30% of the entire New Landfill Cell Project presented in the Preliminary Design Report (Golder reference: 117625003_058_R) as having a total new landfill liner area of 35 ha and approximately six million cubic metres of landfill airspace volume.

The Practical Completion of Package 1A was achieved on 11 August 2014 and P1B completion was achieved on 2 December 2014. At the time of the audit Cell 1A was filled and Cell 1B was being filled with waste.

Construction of the next package of works (Stage 2) commenced in March 2017. Stage 2 works includes two separate lined landfill cells with works comprising:

- demolition of roads, drainage infrastructure and minor structures
- a new haul road to facilitate operational traffic movements (completed early 2017)
- bulk earthworks, including vegetation removal
- installation of new leachate collection infrastructure, including sumps, pipework and a new leachate storage pond
- new landfill gas management infrastructure to collect and drain landfill gas to the existing landfill gas management system

- new stormwater infrastructure to divert clean surface water runoff from the new landfill cells
- new landfill lining systems.

WCC indicated that construction of Stage 2 works was due to be completed mid-2018.

2.3 Activities Occurring During Site Audit Inspection

The following activities were observed during the site inspection, as outlined below:

- Filling of Cell 1B with wastes
- Operation of dumping and recycling areas for residents
- Water management
- Leachate management operations
- Construction of Stage 2 or Package 2 works
- Environmental controls activities

Photos of environmentally significant aspects of the operation taken during the site inspection on 11 September and 27 November 2017, are provided throughout the report. Plans of the WGLEP and locations of monitoring can be found in Annual Return report(s) found on the WCC website.

3 Consultation with Key Government Agencies

As required of the audit scope, MCW Environmental contacted and consulted with key government agencies and local stakeholders on the environmental performance of WGLEP. The following provides a summary of this consultation, as well as outcomes of recent regulatory reviews of WGELP annual reporting.

3.1 NSW Department of Planning and Environment (DP&E)

The auditors contacted the nominated Approvals Officer within DPE on 6 September 2017 by telephone. No specific areas of concern in relation to the WCC Operations or regarding the scope of the IEA was identified by the Approvals Officer. The Officer nominated the agencies considered to be relevant for consultation as detailed in this section. The Officer was not aware of individual relevant contacts within each agency.

3.2 NSW Environment Protection Authority (EPA)

WCC identified the appropriate Officer within the local office of the EPA for consultation. Telephone contact was made with the Unit Head Waste Compliance – Wollongong on 6 September 2017 and was followed by email communication on 6 September 2017 requesting a formal response from the EPA in relation to consultation for the IEA. A response was provided on 7 September 2017 stated the following:

"The Environment Protection Authority (EPA) generally finds Wollongong City Council (Council) to be a professional and effective licensee.

Historically, the key issue of concern to the EPA and nearby sensitive receivers is the emission of potentially offensive odour, particularly during wet weather periods.

Therefore, the EPA would like to propose that the Environmental Audit include a focus on the management of odour sources during normal operating conditions as well as during periods of wet weather with additional leachate/waste water generation.

Relevant conditions from environment protection licence 5862 are:

- *Condition O1.1;*
- *Condition O2.1;*
- *Condition O6.5;*
- *Condition O7.1;*
- *Condition O7.2; and*
- *Condition L4.1."*

The scope of the audit included an assessment of these EPL conditions which are presented in the Compliance Checklist in Appendix B. As two site inspections were conducted at different times, odour management was able to be reviewed for two different weather situations. The site inspections did not overlap with a period of wet weather, hence real time assessment of odour impacts during wet weather was not able to be conducted.

Discussion of odour management and odour complaints is provided in the main body of this report as well as within the compliance checklists in Appendices A and B.

3.3 Roads and Maritime Services (RMS)

The Network & Safety Manager, Southern Region, Regional & Freight for RMS was contacted by Telephone on 15 December 2017 and by email on 17 December 2017. A response was provided on 19 December 2017 stating the following:

"Thank you for the opportunity to comment in regards to Whytes Gully. I have consulted with the team and we have no issues requiring consideration.

RMS understands that the development, along with many others in the area, will have cumulative impact on the level crossing and the regional road network (that is Princes Highway and Northcliffe Drive which are under the care and control of Council). Council continue to monitor and have a long term plan to address growth."

Based on this response, there were no specific areas to address for RMS in the conduct of the IEA.

3.4 Office of Environment and Heritage (OEH)

WCC were not able to provide a specific contact name for consultation. An attempt to contact the local OEH was undertaken in December 2017, however no contact with an appropriate officer was able to be made.

3.5 Wollongong City Council

Wollongong City Council were consulted throughout the audit as owners and operators of the landfill. WCC did not identify any other personnel in the organisation to consult with in respect of the IEA. Comments and input from WCC are provided throughout the document. WCC were involved during interviews and site inspections as well as for the supply of relevant documentation required by the audit.

4 Site Inspection Observations

Site inspections were carried out on two separate days: the first on 11 September 2017, focussing on WCC operations; and the second on 27 November 2017 which focussed on construction activities by contractors. The weather on the first day of inspection was clear, still and sunny. The weather on the second inspection day was overcast and windy.

Table 5-1 presents photographs of infrastructure and issues observed during the site inspection. **Appendix A** and **Appendix B** also include photos of specific and relevant issues observed during the site inspection.

Table 4-1 - Photographs of infrastructure and issues observed during the initial site inspection

Photo No.	Photo Description	Photos (dated 11-9-17 unless otherwise marked)
5-1.	Entry to the weighbridge	
5-2.	Leachate treatment facility. Leachate is directed to sewer from this point.	
5-3.	Generator used for the leachate water treatment facility. Generator is contained within bunding and covered with a roof for weather protection.	

Photo No.	Photo Description	Photos (dated 11-9-17 unless otherwise marked)
5-4.	Chemical dosing area in a bund at the leachate water treatment facility.	
5-5.	Final sediment pond.	
5-6.	Outlet of the final sediment pond (discharge and overflows form the pond are directed to EPL Licenced Discharge Point 1).	
5-7.	Small vehicle waste and recycling transfer area.	
5-8.	Unsealed ground at the small vehicle transfer area wet down with water cart showing dust suppression activities by WCC.	

Photo No.	Photo Description	Photos (dated 11-9-17 unless otherwise marked)
5-9.	Landfill cell in operation showing relatively small tipping face due to topography and piggyback landfill design.	
5-10.	Active tipping face on 11-9-17.	
5-11.	Liner covered with a rainflap to divert stormwater flow away from leachate.	
5-12.	Cleanwater diversion swale installed and lined with gravel for scour protection.	

Photo No.	Photo Description	Photos (dated 11-9-17 unless otherwise marked)
5-13.	Compacting and covering of wastes at the tip face.	
5-14.	View of tipping face from the top of the eastern gully landfill.	
5-15.	Water cart in operation providing dust suppression on internal haul roads.	
5-16.	VENM/ENM stockpile area.	

Photo No.	Photo Description	Photos (dated 11-9-17 unless otherwise marked)
5-17.	Construction of new leachate pond showing liner in place.	
5-18.	View of the construction area from the top of the eastern gully. This area is managed by Contractors ERTECH.	
5-19.	Panoramic view of the landfill.	
5-20.	New and existing leachate ponds. Car storage areas (external to WCC operations) in the background.	
5-21.	Trailer mounted deodouriser in operation near the tipping face.	

Photo No.	Photo Description	Photos (dated 11-9-17 unless otherwise marked)
5-22.	Weather data display for the on automatic weather station located on site.	
5-23.	Litter around the perimeter. There was residual litter observed around the landfill in trees and fences.	
5-24.	A gas manifold at the top of the eastern gully landfill.	
5-25.	Gas flare in operation	
5-26.	A bund was created at the top of the rain flap to divert the stormwater run-off coming from the area upslope of the drain into the stormwater swale and away from the tipping face/leachate collection drain.	

Photo No.	Photo Description	Photos (dated 11-9-17 unless otherwise marked)
5-27.	Flyer made available to the community to educate on proper recycling, acceptable wastes and cost of waste disposal.	
5-28.	Leachate collection infrastructure for Cell 2 being constructed (photo dated 27-11-17).	
5-29.	Tipping face on 27 September 2017. Some odour on top of the eastern gully landfill was observed at this location which was downwind of the tipping area.	
5-30.	MRF operated by Visy Recycling. This was not inspected or included as part of the audit.	

5 Compliance with Statutory Requirements

This Section fulfils the requirement to assess whether the project is complying with the relevant requirements in its Project Approval and Environmental Protection Licence (EPL).

5.1 Approvals and Licences

WCC WGLEP operates under the EPL No. 5862 administered by the Environmental Protection Authority (EPA). The NSW Department of Planning and Environment (DP&E) granted Project Approval 11_0094 on 3 April 2013.

Table 5-1 identifies the major approvals, licences in place for WGLEP and provides relevant information were applicable.

Table 5-1 - Summary of Major Approvals and Licences

Title	Summary	Date Granted	Expiry
Minister's Condition of Approval 11_0094 for Whytes Gully Landfill Extension Project		3 April 2013	
Environment Protection License EPL 5862		29 May 2008	Until surrendered
Sydney Water Trade Waste Agreement 11205		14 August 2017	9 months from 1 August 2017 unless surrendered

A compliance assessment of the Sydney Water Trade Waste Agreement 11205 was not conducted as part of this audit.

5.2 Project Approval

The NSW Department of Planning and Environment (DP&E) granted Project Approval 11_0094 on 3 April 2013. Appendix 1 of the Approval comprises Statements of Commitments relevant to the project. There have neem no approved Modifications to the approval, however, there are two modifications currently under review by DPE. These were not considered in this audit. An assessment of compliance with the Project Approval is provided in **Appendix A** of this report.

5.3 Environmental Protection Licence 5862

Council holds an Environmental Protection Licence (EPL) number 5862, for "Waste Disposal by Application to Land" for the Site. Council currently operates in accordance with the sites Landfill Environmental Management Plan (LEMP). Evidence of the compliance status with the EPL 5862 conditions is provided in **Appendix B**.

The EPL has had undergone several variations to it in recent years. These have included:

- Removal of requirement to monitor redundant or removed environment monitoring points MP2, MP6, MP7 & MP8 on 22 June 2017.
- Approval to construct Package 2 & 3 Landfill Cells/Deep Leachate Drainage System dated 20 January 2017.
- Approval granted to construct and operate the new contingency leachate pond dated 23 November 2016.
- Approval to reinstate cover material descriptions and allow specific material types. Additional conditions regarding the management of onsite sediment basin/s at the premises. Streamline, add and update waste management conditions dated 14 October 2016.
- Approval granted to dispose of waste in Cell 1B on 01 September 2015

- Approval granted to dispose of waste in Cell 1A on 28 October 2014.
- Site boundaries updated to excise the previous Solid Waste to Energy Recovery Facility from the landfill licence to allow Visy to gain their own licence for the retrofit of the building as a Materials Recovery Facility. Also addition of a Potential Offensive Odour clause and analytical unit measures amended on 08 July 2014.
- Wording amendments and consolidation of various clauses as well as monitoring point updates on 23 August 2013.
- Inclusion of further enhanced and upgraded environment sampling points on 23 August 2013 for the Stage 3 (new landfill cell development).
- Overhauled and reformatted licence resulting from Council's request to modernise environmental testing requirements and to formally recognise the increased environmental sampling points and standards adopted by Council for the site. The request formed Annexure B of the 2010/2011 Annual Environmental Management Report and was formally approved and adopted by the EPA on 16 April 2012.
- Tidy up of various incremental site changes including lot and boundary amendments, sampling point review and update including location detail, removal of redundant trial and reporting details and various other updates in line with EPA reformatting and internal software and consistency changes on 16 April 2012.
- Addition of pollution studies and reduction programs added on 28 November 2008.
- Scheduled Activity and Waste Classification structure changed on 17 October 2008.
- Reformatted licence including specification for cover material, litter control and other operational processes on 20 November 2007.
- Clarification of water pollution prevention requirements on 11 October 2005.

Various analytical data sets are collected on a monthly, quarterly and annual basis:

- Groundwater Monitoring – Quarterly (February, May, August and November)
- Stage 3 Bores and Surface Water Monitoring – Quarterly (February, May, August and November)
- Surface Water Monitoring – Annually in August
- Air Monitoring – Monthly

Results of the above monitoring are posted in the WCC public website and reported every year to EPA through Annual Return to EPA. These annual returns are also uploaded to the WCC website.

5.4 Key Strategies, Plans & Programs

Table 6-2 summarises the strategies, plans and programs required by MCoA 11_0094.

Table 5-2 - List of Strategies, Plans and Programs

Strategy / Plan / Program	Date Prepared / Revised	Approval Date
Landfill Environmental Management Plan	September 2014	11 December 2014
Construction Environmental Management Plan	13 August 2013	20 August 2013
Flood Emergency and Evacuation Plan	19 August 2013	29 August 2013
Soil, Water and Leachate Management Plan (Appendix E of LEMP)	November 2008	11 December 2014
Vegetation and Biodiversity Management Plan	Initially prepared by Biosis on 1 August 2013	14 December 2017

Strategy / Plan / Program	Date Prepared / Revised	Approval Date
	Reviewed (but not updated) by Biosis in July 2017	
Pollution Incident Response Management Plan Revision 3	1 July 2017	EPL Requirement
Wollongong City Council Waste and Resource Recovery Strategy 2012 to 2022	18 July 2014	Submitted with LEMP 14 December 2014

5.5 Compliance Assessment

The status of WGLEP's performance during the audit, in respect of each condition of the MCoA, EPL, SoC is presented in **Appendix A and Appendix B**. Conditions considered to be not complied with, or not able to be verified, have been listed in Section 10 of this report.

Table 6-3 provides a summary of the performance categories in respect the compliance status for each requirement or commitment as defined in the *Post Approval Requirements for State Significant Developments, Independent Audit Guideline* (NSW Government, October 2015, p7).

Table 5-3 - Performance Category Assessment Criteria

Performance Category	Definition
Compliant	Currently in compliance. Sufficient verifiable evidence was available to demonstrate that the intent and all elements of the requirement of the regulatory instrument had been complied with within the scope of the audit.
Non-compliant	Currently not in compliance. Sufficient verifiable evidence was available to demonstrate that the intent of one or more specific elements of the regulatory instrument have not been complied with within the scope of the audit.
Administrative Non-compliance	A technical non-compliance with a condition of the consent that would not impact on performance and that is considered minor in nature (e.g. report submitted but not on the due date, failed monitor or late monitoring session). This would not apply to performance related aspects (e.g. exceedance of a noise limit) or where a condition had not been met at all (e.g. noise management plan not prepared and submitted for approval).
Not Verified	It has not been possible to determine whether compliance exists. Sufficient verifiable evidence to demonstrate that the intent and all elements of the requirement of the regulatory instrument have been complied with within the scope of the audit was not available.
Not Triggered	Condition not applicable at time of audit or had not been triggered
Observation	The identified issue(s) of concern do not strictly relate to the scope of the audit or assessment of compliance. Further observations are considered to be indicators of potential non-compliances or areas where performance may be improved.
Noted	A statement or fact, where no assessment of compliance is required.

Auditor's comments are provided next to each condition to explain evidence sighted relevant to each condition. Where considered relevant, observations have been made regarding specific compliance issues.

Conditions considered Non-compliant are presented in **Table 8-1** (Section 8) of this report. The table includes a discussion of the compliance status and recommendations for improvement where appropriate.

Where conditions were considered compliant; however it was considered a continuous improvement opportunity existed to improve the compliance status or to improve environmental performance in relation to the condition, an Opportunity for Improvement (OFI) comment/recommendation has been made in the compliance table. A summary of OFIs are provided in **Table 8-** (Section 8) of this report.

The auditors have not undertaken a technical assessment of the documents required by the MCoA or EPL, particularly where these documents have been signed off and/or approved by relevant regulatory authorities (for example, DP&E and the EPA). A high level review of adequacy of some documents is provided in Section 7 of this report.

Further, where conditions require specialist input, compliance with these conditions has not been assessed in full e.g. specific traffic and bushfire conditions.

On the direction of WCC, auditors did not include the MRF, operated by Visy recycling, within the scope of the audit.

6 Environmental Performance

This Section addresses the requirement of the scope of the audit to "*assess the environmental performance of the development*".

The auditors based the assessment of the environmental performance of the Project on the following:

- assessment of compliance with the Conditions of Approval (CoA), SoC (Statement of Commitments) and the Environment Protection Licence (EPL). The findings of these assessments are provided in the Compliance Matrix presented in Appendix A and Appendix B with the identified non-compliances and associated recommendations summarised in Section 10.
- environmental performance as reported in EPL Annual Returns
- the extent of the project in relation to the approved boundary, and potential off-site impacts
- environmental incidents that have occurred on site
- community complaints received during the audit period
- assessment of implementation of the management and monitoring plans (discussed in Appendix A and B)
- feedback received by consultation from the Department, and other agencies and/or other stakeholders, including from the community/Community Consultative Committee, on the environmental performance of the project during the audit period

6.1 Environmental performance as reported in EPL Annual Returns

Annual Returns under the EPL have been reported on the WCC website for the audit period.

The annual returns provide a summary of the results for environmental monitoring required under the EPL and present results for surface water; groundwater; air and noise monitoring. Data is graphed and trended with previous monitoring results and an interpretation of results is provided. In addition, exceedences of EPL criteria are presented. Auditors have not assessed the monitoring results or interpretations as part of this audit. The results for the May 2016 to May 2017 Annual Return are discussed below by exception, noting the returns are publically available.

Reported EPL Non Compliances and Penalty Notices: A summary of the non compliances and penalty notices reported in the annual returns for the audit period is provided below:

- 29 May 2013 to 28 May 2014 - O6.4 - Non-compliance with Condition O6.4 - The licensee must not exhume any landfilled waste unless approved in writing by the EPA. Penalty Notice issued as per above.
- Penalty Notices - O6.4 -Non-compliance with Condition O6.4 was raised on 22 May 2014 – The licensee must not exhume any landfilled waste unless approved in writing by the EPA. The Penalty Notices numbers were 1521880 and 1521881.
- 29 May 2016 to 28 May 2017 - L2.1/L2.4 - Exceed limit for TSS at LDP 1 on 2 occasions (June and July 2016) due to high intensity rainfall events.
- 29 May 2015 to 28 May 2016 - L2.1/L2.4 - Exceed TSS Concentration Limit at LDP1 after heavy rainfall event on 25/08/2015 (approximately 150mm over 24hours).
- 29 May 2015 to 28 May 2016 - R1.7 - Official Caution was received for failing to identify 2013-14 Penalty Notice within Statement of Compliance section of 2013-2014 Annual Return.

Surface Water: The Annual return dated May 2016 to May 2017 stated for surface water: *"Whilst the majority of analytical samples taken during the reporting period indicate low contamination levels in the sediment ponds, there has been two (2) non compliances with Environmental Protection Licence requirements associated with higher than acceptable suspended solids exiting the site during heavy rainfall. Whilst not a chemical or biological contamination issue, the result shows that the sediment ponds need additional care and maintenance moving forward."*

Groundwater: The Annual return dated May 2016 to May 2017 indicated increased concentrations for some dissolved metals in groundwater in monitoring wells 11 and 16. The report stated the following in relation to Groundwater Testing Results Interpretation:

"Key indicators of landfill leachate's potential ingress into groundwater particularly ammonia, nitrate, nitrite levels and other less poignant indicators as tested do not conclude that that landfill leachate is entering the surrounding ground water system. However, the results presenting in monitoring wells 11 and 16 in particular warrant continued scrutiny."

Based on the above, the frequency of testing for some analytes at monitoring wells 11 and 16 was increased after this Annual Return.

Air Emissions: The annual return dated May 2016 to May 2017 reported the following in regards to "Methane Gas Monitring:

The surface emissions sampled in August 2016 (located at the edge of the liner) and September 2017 (located at the southern edge of the cell) were recorded above acceptable limits, however upon further investigation it is noted the surrounding grid pattern (25 meter spacing's) did not register elevated levels. Both areas were monitored and further samples taken have been low and in line with historical trends."

The annual return dated May 2016 to May 2017 provided the following summary for air emissions:

"During the period 2011-2012 results sampled by GHD showed continued occurrences of surface methane emissions above the EPA recommended threshold levels. A more recent contract awarded to a NATA approved laboratory (ALS Environmental) has shown that the GHD recorded levels were potentially overstated. Both companies state that the accumulation monitoring clearly shows that the methane is not migrating offsite. Despite the differences in sample results, the site has the potential to generate relatively high amounts of landfill gas, namely methane that must be dealt with. Accordingly, Council commenced installation of methane gas extraction infrastructure in February 2014. Phase 1 (covering the older western gully) of the landfill gas management is in place and connected to a flaring unit. Phase 2 (capturing gas from legacy waste in under the new cell liner in eastern gully) has been fully constructed and has been commissioned. The final Phase 3 gas collection system will include infrastructure within the waste filling of the new landfill cell at the WWARRP."

6.2 The extent of the project in relation to the approved boundary, and potential off-site impacts

Based on site observations, physical WCC operations have stayed within the boundaries of the site as defined in the EA. The audit did not consider operations at the MRF as WCC indicated these were under the control of Visy Recycling.

Key potential off site impacts are likely to comprise have been discussed in the compliance assessment detailed in Appendix A and Appendix B. Odour impacts as identified through complaints are discussed below in Section 6.3. A summary of potential impacts is provided above in relation to Annual Return Reporting.

6.3 Environmental Incidents

The site's Pollution Incident Response Management Plan (PIRMP) contains details of how employees should respond to an environmental incident and the requirements and processes in relation to the external reporting of environmental incidents requiring external notification under legislation/approval conditions.

The EPL also requires the PIRMP to clearly document pollution risks, communication procedures with authorities and the community regarding pollution incidents as well as testing and training for pollution

response. In the event there is a pollution incident involving material harm or threatening material harm to human health or the environment, the PIRMP is to be implemented.

The environmental incident register (Z14/224119) Current Environment Monitoring Landfill Sites is used to record and monitor environmental incidents. The register enables record keeping, reporting and determining improvements to incident response and review of the Plan. The register is kept by the WHSQE Officer – Waste Services.

MCW Environmental requested all incident reports be provided for the purposes of the audit. WCC provided the following incident reports:

- An ICAM report for an incident dated 13 July 2017 where damage occurred to an existing leachate line located in the vicinity of the new leachate pond due to excavation activities in the area. A small volume of leachate leaked into the excavation. The leachate was contained on site.
- Incident reports for complaints relating to odours – these are discussed in Section 6.4 below.

It is not clear that there were no other incident reports prepared during the period.

No incidents that caused material harm to the environment were reported to the EPA during the period of the IEA from 2013 to 2016 in the EPA Annual Returns.

6.4 Complaint Management

WCC reported that Complaints are logged in Council's Customer Request Management System 'Pathways'. Complaints are reported to the community in summary form only, via the annual returns which are published on our website.

The EPA receive investigation reports:http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx

The following table provides the number of complaints raised per year in EPL Annual Returns:

Table 2 Summary of Complaints reported from 2013 to 2017

Annual Return Report	Number of Complaints
29 May 2013 to 28 May 2014	48
29 May 2014 to 28 May 2015	10
29 May 2015 to 28 May 2016	38
29 May 2016 to 28 May 2017	27

Based on the EPL annual return 29 May 2016 to 28 May 2017, the overlying trend for environmental complaints had been downward after closure of the solid waste energy recovery facility in 2004. However, the reporting periods 2011/12 to 2013/14 indicated a spike of approximately 150 complaints, invariably regarding perceived odour from the WWARRP. It should be noted that WCC commenced community engagement over a new landfill cell development at Whytes Gully coinciding with the 2011/12 year complaints spike.

From 01 July 2014, kerbside green waste was not stored at the WWARRP, instead it was unloaded at a nearby site on Reddalls Road. Organics received at the WWARRP are removed from site and processed at the above mentioned nearby facility.

WCC stated that air pollution complaints received were investigated, noting evidence was gathered and data from the on-site weather station was used to compare the source of the odour and prevailing wind direction relative to the Wollongong Waste and Resource Recovery site (Whytes Gully).

WCC reported that the bulk of the complaints (almost 85%) conveyed in the 2016-2017 reporting period were received in March 2017 and that the majority of the pollution complaints received coincided with the timing of the proposed expansion of the nearby organics processing facility and the associated notification and advertising to key stakeholders and neighbours.

WCC provided Incident Investigation Reports for odour complaints on: 24 November 2016; 6 March 2017 (four complaints); and 17 March 2017. The reports provide information on weather conditions at the time of the complaint; immediate control actions taken; and corrective actions to prevent a recurrence. Corrective actions were generally reported as comprising: cover waste as per EPL; ensuring deodoriser trailer is activated; ongoing assessment throughout the day.

The EPA provided a letter in response to complaints in March 2017 and noted that *"it believes it has identified the cause of the recent odour complaints which relate to a premises not under Wollongong City Council Control."*

6.5 Addressing Recommendations from the Previous Independent Environment Audit

This is the first Independent Environment Audit conducted at Whyte Gully Landfill Extension Project, hence there were no recommendations from previous reports to assess compliance with.

7 Environmental Management Systems and Plans

This Section fulfils the requirement to assess the adequacy of strategies, plans or programs required under the Project Approval. The implementation of the management plans / programs is discussed in **Appendix A and Appendix B**.

7.1 WCC WGLEP Environmental Management System Overview

WCC WGLEP operates under the MCoA 11_0094 and EPL 5862 which together appear to drive the development of procedures and approaches by WCC. The environmental mitigation measures, monitoring, inspections review of performance in compliance with approvals and licenses are defined in the LEMP and CEMPF.

These documents are voluminous (the full LEMP contains over 1900 pages), which appear largely developed for approval purposes rather than for ease of implementation. In response to this, WCC have developed various Standard Operating Procedures (SOPs) such as the Placement & Compaction of Waste SOP and the Deodouriser Trailer Operator Manual - Whytes Gully SOP. In addition, a Wet Weather and Stormwater Management work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. WCC reported that further works are planned to produce more site level implementation documents similar to these SOPs and Work Instructions. WCC did not explain how these documents integrated into the LEMP or any other site based system approach.

There was no other apparent system approach defined by WCC for environmental management such as a structured Environmental Management System Framework. The LEMP and CEMPF documents do not include key aspects of Environmental Management Systems as defined in the ISO14001 Standard such as: setting and updating objectives and targets; regular conduct of risk assessments; systems of auditing; annual reviews etc.

Further WCC did not provide formal internal audit reports of the CEMP; or the CEMPF that assessed the implementation or effectiveness of these documents. WCC did provide numerous examples of where the LEMP and CEMPF had been implemented, such as inspection records and checklists – these are further described in Section 7.2 and in Appendices A and B.

Based on site discussions, it appears that the LEMP is a cumbersome document in terms of a management system for implementation at site level and there are further opportunities for improvements in the development of a more efficient and comprehensive site based environmental management system.

Management System Recommendations

It is recommended that:

- **WCC review approaches to site based management systems and the integration of these with the LEMP.**
- **WCC review current approaches as defined in the LEMP and CEMPF against the requirements of formal EMS Standards (such as a Gap Analysis) to ascertain what current approaches may be missing in terms of an overall system approach, and whether WCC could benefit from implementation of such approaches.**
- **WCC conduct regular audits of the implementation and adequacy of the LEMP; Contractors CEMPs; the CEMPF and other WCC systems to ensure ongoing implementation and effectiveness of controls.**

7.2 Management Programs and Plans

The following documents were reviewed for adequacy by the auditors with a summary of the review provided in Table 7-1:

- Landfill Environmental Management Plan
- Construction Environmental Management Plan

The review of adequacy was high level only; and did not comprise a technical review of any aspect of the Plan or appendices. This was due to the nature and extent of the LEMP and CEMP documents; the technical and specialist detail in the documents; and that the documents have not been reviewed in detail since their original approval in 2014.

A key finding of the review is that WCC conduct a detailed review of the documents to ensure their ongoing effectiveness in achieving performance measures defined in the Project Approval; Environmental Assessment and EPL; and to ensure the documents are up to date and adequate in respect of site operations; environmental legislation; the EPL; and current procedures used by WCC.

7.2.1 General Summary of Management Plan Adequacy Review

WCC has established key management and monitoring plans/programs under the scope of the WGLEP Landfill Environmental Management Plan and Construction Environmental Management Plan.

In general, these plans and programs are established and implemented in general accordance with the consent conditions of MCoA 11_0094 and the requirements of EPL 5862, subject to the comments made in Appendix A and Appendix B and in this report. This audit was not a management system audit, and did not assess all aspects of the implementation of these plans, hence comments on the LEMP and CEMPF are not comprehensive.

The management plans provide information to manage, monitor and report on environmental aspects and impacts associated with the landfill operations and construction of new cells.

The findings of a high level review of the adequacy of the management plans / monitoring programs and subsequent recommendations are provided in **Table 7-1**.

Table 7-1 - Adequacy Review of Management Plans / Monitoring Programs

Management Plan / Monitoring Program	Adequacy Review and Recommendations
Landfill Environmental Management Plan and associated sub-plans	The LEMP was prepared by Golders in September 2014 and approved by DPE on 11 December 2014 in compliance with MCoA 11_0094 Schedule 18, 29, 34, 40, and 49 of Schedule 4 of the Project Approval for the Whytes Gully Landfill Extension Project. The LEMP contains a number of sub-plans which are required by the condition of approval such as: • Flood Emergency and Evacuation Plan (Condition 16 of Schedule 4) • Soil, Water and Leachate Management Plan (Condition 18 of Schedule 4) • Air Quality Management Plan (Condition 29 or Schedule 4) • Greenhouse Gas Management Plan (Condition 30 of Schedule 4) • Noise Management Plan (Condition 34 of Schedule 4) • Vegetation and Biodiversity Management Plan (Condition 49 of Schedule 4) • Landfill Closure and Rehabilitation Plan (Condition 51 of Schedule 4) Monitoring programs (groundwater, surface water, dust and leachate management) as per the EPL which are defined in the LEMP are conducted and monitoring results are posted in WCC website. The implementation of the LEMP and associated subplans on sites operations has not been reviewed or internally audited to ensure it's adequacy and effectiveness. Many aspects of the LEMP document are out of date e.g. it still refers to all of the development consents that WCC are to have surrendered under the Project Approval; it refers to out of date legislation; it has not been updated to reflect the numerous EPL variations issued and quotes EPL requirements that have since changed; Operating Procedures detailed in the LEMP have been updated and are now superceeded in some instances; and the LEMP has not been modified to reflect some current on site practices that have changed since 2014 (e.g. MRF and recycling facility). A number of appendices the LEMP are now out of date or not relevant to be included as part of the LEMP. It was noted that some Standard Operating Procedures have been updated, however these were not linked to the LEMP. **Recommendations:** That the LEMP and associated sub-plans be reviewed and updated as required and ensure their effectiveness and adequacy. Technical aspects of the review should be undertaken by suitably qualified people. That the LEMP update include a rationalisation of documents appended to the LEMP to make it a more manageable sized document and to remove aspects of the document now not considered relevant. This could include that various design related documents being uploaded to the WCC website separately, instead of being appendices to the LEMP. The LEMP and associated subplans are required to be posted on the WCC website. That key requirements of the LEMP be reflected in operating level systems and procedures (see recommendations under Section 7.1).

Management Plan / Monitoring Program	Adequacy Review and Recommendations
Construction Environmental Management Framework and associated sub-plans	The CEMPF has been prepared by Golders in August 2013 and approved by DPE on 20 August 2013 in compliance with Condition 2 of Schedule 5. The CEMP contains a number of sub-plans which are required by the condition of approval such as: • Construction Quality Assurance Plan (Condition 13 of Schedule 4) • Contamination Management Plan (Condition 19 of Schedule 4) • Noise Management Plan (Condition 34 of Schedule 4) • Construction Traffic Management Plan (Condition 38 of Schedule 4) • Heritage Management Plan (Condition 48 of Schedule 4) and • Vegetation Management Plan (Condition 49 of Schedule 4). The CEMP and subplans have not been reviewed since they were approved by DPE prior to construction. It was noted that the CEMP of contractors i.e. ERTECH has been reviewed and approved by WCC as per the requirements of CEMPF. The implementation of the CEMPF and associated subplans has not been reviewed or internally audited to ensure it's adequacy and effectiveness. The Public Works Surveillance Team conducts weekly inspections of the construction site to ensure mitigation measures are implemented (i.e. erosion and sediment control, plant inspection, quality control, dust). **Recommendation:** That the CEMPF and its associated sub-plans be reviewed and updated as required and ensure implementation and effectiveness on construction works. The CEMP and it's associated subplan be posted on the WCC website.
Vegetation and Biodiversity Management Plan	The vegetation and biodiversity management plan has been prepared in 2013 and approved under the LEMP by DPE in 2014. Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013). Biosis understands that Council require an updated assessment of the current condition of the vegetation within the study area and the maintenance required to meet the performance criteria to date as outlined in the VMP (Biosis 2013). Performance criteria 'to date' has been based on the assumption that the proposed works program would currently be in year four, if the VMP had been implemented in 2014. A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outlined in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12 month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works. **Recommendation:** Update the Vegetation Management Plan with the findings of the review of the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2017).

8 Summary of Non Compliances and Recommendations

Some non-compliances have been identified with the MCoA conditions and EPL conditions, and SoC conditions. These non-compliances as well as the requirements assessed as Not Verified and the associated recommendations have been consolidated and are summarised in **Table 8-1** below.

For a number of requirements that were assessed as compliant or not applicable, recommendations were made where continuous improvements were identified. These requirements and recommendations are summarised in **Table 8-1**.

Recommendations relating to observations of general environmental management, the adequacy of the various plans / programs are provided in Section 7.

Table 8-1 - Non-Compliant and Not Verified Conditions – MCoA 11_0094 and Statement of Commitments

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation
Sch 3 Condition 7	Within 12 months from the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall surrender the development consents identified in Table 1 in accordance with Section 75YA and 104A of the EP&A Act.	At the time of the audit site inspections, WCC could not demonstrate that they had surrendered the previous development consents. On 29 March 2018, WCC provided documents showing that WCC surrendered all of the leases detailed in Table 1 on the leases on 13 March 2018, except for DA 1996/8256 and DA-1996/6256. The surrender of leases followed an application to surrender the leases dated 7 February 2018. On the basis that the Development Consents were not surrendered within 12 months of the date of the Approval (being 3 April 2013); and that surrender of two development consents may be outstanding; WCC is considered non-compliant with this condition.	Non-compliant **Recommendation**: Ensure that development consents DA 1996/8256 and DA-1996/6256 are surrendered in accordance with Condition 7: Schedule 3.
Sch 4 Condition 9	The Proponent shall: a) implement suitable measures to prevent the unnecessary proliferation of litter both on and off-site, including the installation and maintenance of a mesh fence of not less than 1.8 metres high around the site; and b) inspect daily and clear the site (and if necessary, surrounding area) of litter on at least a weekly basis.	Fencing was installed around the boundary of the landfill. Cleaning of litter around the perimeter was reported to be conducted by WCC on a campaign basis at least weekly. WCC reported that daily inspections are carried out that includes litter inspections. A template form including the item "workplace free of litter and obstructions" was sighted. During the site inspection significant quantities of litter was observed across the site, generally caught in obstructions such as shrubs, trees and fences and also in and around landfill areas. Off site areas were not accessible to inspect. Minutes of the 2017 Whytes Gully reference group (22 November 2017) indicated that residents advised *"that there is a lot of rubbish around, In particular in Reddalls Road, from the corner of the tip to the car yard. One member also mentioned that the area near where he lives there are plastic bags up in the trees."* On the basis of site observations during both site inspections, and the feedback from community representatives at the November Whytes Gully reference group, that WCC are not compliant with this condition and that there is significant opportunity to reduce the amount and extent of litter at the site (and off site) through better controls or through more frequent litter reduction campaigns. It is noted that the condition requirement to *"clear the site"* of litter is very challenging given the extent of plastic bags etc. disposed of at the landfill on a daily basis.	Non-compliant **Recommendation**: Increase the effectiveness of litter reduction controls and of litter reduction campaigns to reduce on and off site litter. OFI: Reconsider with DPE what would be acceptable in terms of "clear the site of litter" so as to be able to comply with this condition.
Sch 4 Condition 14	The Proponent shall ensure that all licensed surface water discharges from the site comply with the discharge limits (volume and quality) set for the project in any EPL or relevant provisions of the POEO Act.	As noted in the annual report 2016-2017, surface water that exited the site in June 2016 and July 2016 contained suspended solids at levels above the 50mg/L concentration limit prescribed in the sites Environment Protection Licence. Downstream samples taken at the same time indicated suspended solids <50mg/L concentration limit and it was reported by WCC that there was no material harm caused by the non-compliance (as defined by Section 147 of the POEO Act 1997). To help reduce the likelihood of future non-compliances, a Wet Weather and Stormwater Management work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. Since the implementation of the new work instruction, no further sediment rich discharges have occurred. Council consider that these are historic results and that Council has implemented amended controls to eliminate recurrence, noting that controls implemented are performing as designed. Though the above situation has been reported by WCC through the EPL Annual Report for 2016-2017, the exceedance of suspended solids above the discharge limit is noted as non-compliant to this condition.	Non-compliant **Recommendation:** Continue to review the effectiveness of corrective actions applied to site water management and address any further non compliances as required.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation
Sch 4 Condition 18e	The Proponent shall prepare and implement a Soil, Water and Leachate Management Plan for the project in consultation with Council, NOW and the EPA and to the satisfaction of the Director-General. This plan must be prepared and implemented by a suitably qualified and experienced person and be approved by the Director-General prior to the commencement of operation. The plan must include: e) an on-going surface water, groundwater and leachate monitoring program that includes (but is not limited to): a commitment to provide the results of monitoring to NOW and other relevant government agencies every 12 months	WCC did not provide evidence that results of monitoring are reported to NOW and other relevant government agencies every 12 months, hence compliance with this aspect of the condition was not Verified.	Not Verified **Recommendation:** Provide results of monitoring to Crown Lands and Water (formerly NOW) and other relevant government agencies every 12 months as required of the condition.
Sch 4 Condition 23	The Proponent shall ensure the project does not cause or permit the emission of any offensive odour (as defined by the POEO Act).	No offensive odour was noted at the time of the first site inspection during calm, and sunny conditions. A deodoriser was observed to be in operation during the first site visit. However, during the second site visit, some odour was observed up slope of the tipping face on the high point of the landfill, which was downwind at the time of the inspection. The odouriser was not in operation during the second site visit. There did not appear to be a process for specific management of the face during these more adverse wind conditions. It was noted that the tipping face was being kept small and cover was being used during both site inspections. Minutes of the Whytes Gully Reference Group meeting on 24 May 2017 indicated that one member *"mentioned the smell in the morning when the lids are lifted. It was advised that the deodoriser trailer is turned on prior to site start up to minimise odour generated. Another member mentioned that sometimes the smell is as late as 10:00am."* No mention of odour was made in the Minutes of the Whytes Gully Reference Group meeting on 22 November 2017. Selected incident reports were provided by WCC for odour complaints on 24 November 2016 (1 complaint); 6 March 2017 (4 complaints); and 17 March 2017 (4 complaints). The reports showed that complaints are followed up with weather data and other factors documented. The EPA issued a letter to WCC dated 30 March 2017 responding to a letter from WCC dated 21 March 2017 in relation to odour complaints made in March 2017. The EPA noted that the identified the cause of the complaints relates to a premises not under the control of WCC. Given the audit site inspections were of limited duration, it was not possible to fully assess compliance with this condition and hence is considered Not Verified.	Not Verified **Recommendation:** WCC to ensure that odouriser is in operation as required to minimise the risk of offensive odour going off site. It is recommended that WCC review the implementation of the procedure regarding the use and placement of the odouriser. **Recommendation:** It is recommended that WCC conduct additional odour monitoring to re-assess the potential for odours during southerly winds and assess if existing controls are adequate to prevent off site odours. Based on the outcomes of the monitoring, additional controls may be warranted.
Sch 4 Condition 36	The Proponent shall ensure that c) the project does not result in any vehicles queuing on the public road network; d) heavy vehicles and bins associated with the project do not park or stand on local roads or footpaths in the vicinity of the site; e) all vehicles are wholly contained on site before being required to stop;	No queuing of vehicles noted during the site audit, however it was indicated that some waste trucks are likely to queue on the road outside the facility before 7:30 am waiting for the site and weighbridge to be opened. Due to the extra lane on the road adjacent to the entrance to the facility, trucks are able to queue and not obstruct local traffic. During operating hours, there is room for vehicles to queue on site prior to having to stop. Consultation with RMS did not identify any traffic related issues relating to WCC Operations in this location. Auditors did not observe trucks queuing on public roads, and hence were unable to verify from observation the extent and nature of queuing on public roads. Hence auditors were not able to verify if WCC are not compliant with sub conditions c, d and e.	Not Verified **Recommendation:** That WCC manage the road in accordance with the condition. Alternatively, confirm with RMS that current arrangements related to trucks parking outside the facility prior to opening is acceptable, and notify DPE of the outcomes of this consultation.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation
Sch 4 Condition 45	The Proponent shall: a) implement suitable measures to manage pests, vermin and declared noxious weeds on site; and b) inspect the site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in surrounding area. *Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Noxious Weed Act 1993.*	During the site inspections, numerous weeds including noxious weeds were evident across the site. Current weed controls appeared limited and was not able to be explained in detail by WCC. Based on site observations, weed controls measures across the site were not adequate or effective. WCC reported that the site is inspected monthly and control undertaken periodically derived from inspection results. Implementation records provided included: 1) a schedule of weed management visits for all of council's sites. This indicated site visits on 7 occasions were scheduled over 2017; 2) emails discussing various weed areas and requesting weed control services during 2016 and 2017; WCC did not demonstrate that a systematic and through approach is taken to management and control of weeds at the site. Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013). A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outlined in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12-month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works. WCC provided a screen shot of records for Wild Dear Operation - Feral Animal Control - Whytes Gully with latest record dated 24, 25, 26 October 2017. Given the extent of weeds across the site, WCC are considered not compliant with this condition. Implementation of the control measures defined by Biosis will go towards addressing compliance issues with this condition.	Non-compliant **Recommendation:** Implement the controls in the program as defined by Biosis for pest, vermin and noxious weeds management.
Sch 4 Condition 49	The Proponent shall prepare and implement a Vegetation Management Plan for the project to the satisfaction of the Director-General.	Implementation: Based on the issues related to weeds identified above in Condition 45; and outcomes of the Biosis report where more stringent weed actions are defined to be required, WCC are considered to be Non Compliant with the implementation of the weed controls measures identified in the Vegetation Management Plan.	Non-compliant (Implementation) **Recommendation**: It is recommended WCC implement weed controls as defined in the Vegetation Management Plan. **Recommendation:** That WCC complete the implementation of the Vegetation Management Plan in full (in addition to weed management as defined above) and in regard to Offsets as detailed in the Vegetation Management Plan. **Recommendation:** Report progress in implementation of the VMP in Annual Environmental Reports.
Sch 5 Condition 3h	Prior to the commencement of operation, the Proponent shall update the draft Landfill Environmental Management Plan in the EA for the site to the satisfaction of the Director-General. This plan must: h) be placed on Council's website within 2 weeks of its approval.	At the time of the audit site inspections (hence for the audit period), the Draft LEMP was posted in DPE website, and the final LEMP was not posted on the WCC website, hence at the time of the audit WCC were not compliant with this condition. As of 26 February, the Final LEMP was located on the WCC website.	Non-compliant

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation
Sch 5 Condition 4	The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: a protocol for periodic review of the plan.	The requirement for periodic review is documented in the LEMP and CEMPF. Based on discussions with WCC, annual reviews of the LEMP and CEMPF were not conducted. The latest version of the LEMP and CEMPF were dated 2014. Following issue of the Draft Report, WCC indicated that they consider completing the checklist provided in Section G of the EPL Annual Return as a review of the adequacy of the LEMP and CEMPF.	Non-compliant **Recommendation:** Implement a formal review process for the LEMP and CEMPF. Where relevant and based on the findings of the review, update the LEMP.
Sch 5 Condition 5	One year after the commencement of operation, and annually thereafter, the Proponent shall review the environmental performance of the Project to the satisfaction of the Director-General. This review must: a) describe the operations that were carried out in the past calendar year; b) analyse the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the • relevant statutory requirements, limits or performance measures/criteria; • monitoring results of previous years; and • relevant predictions in the EA; c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	WCC provided Annual Reports that incorporate Annual Returns required under the Environmental Protection Licence for the years 2012-2013 to 2016-2017. The objective of the Annual Report is stated as being required under Condition R1.8 of the EPL which specifies that WCC must provide an Annual Report to accompany the Annual return for the site. The objective does not appear to reflect the requirements of this condition with thin the Project Approval. The Annual Report address some of the requirements of the condition, however, these reports do not consider compliance with the Project Approval nor meet all aspects of this condition. Specifically, the reports do not cover the following aspects of the condition: - 5a) describe the operations that were carried out in the last year; - 5b) third bullet point: Provide a comparison of results against the relevant predictions in the EA; or - 5c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; In summary, WCC are compliant with many aspects of the condition, however, the scope of current reports do not address some aspects of the condition.	Non-compliant **Recommendation:** It is recommended WCC increase the scope of the Annual Reports to address all of the requirements of Condition 5 (Schedule 5) specific to the Project Approval.
Sch 5 Condition 9	Within a year of the commencement of operation of the project, and every 5 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the Project.	This audit is the first audit to be commissioned by WCC since Approval for the Project and since Stage 1 operation of new cell commencing in 2014. To comply with this condition an audit was required in 2015. An independent environmental audit was not conducted a year after commencement of operation of Stage 1, hence WCC are non compliant with the timing related to this condition.	Non-compliant
Sch 5 Condition 11	From the commencement of construction of the project, the Proponent shall make the following information publicly available on its (Council's) website as it is progressively required by the approval: c) a copy of the current plans and programs required under this approval; a complaints register, which is to be updated on a monthly	The LEMP and CEMPF were not posted on the WCC website at the time of the site inspections and hence WCC are considered as non compliant with this condition. As of 26 February, the documents were sighted on the website. All complaints are logged into Councils Customer Request Management System 'Pathways'. Complaints are reported to the community via the annual returns which are published on our website. WCC do not have a register of all complaints posted on the WCC website as required of the Condition. WCC have a complaints form in the LEMP, however, evidence of the use of this form was not provided by WCC and an Environmental Incident Report form was sighted for complaints.	Non-compliant **Recommendation:** It is recommended that a register of complaints, updated monthly, is provided on the WCC website. **OFI:** Update the LEMP with the form being used by WCC for the recording of complaints.
Statement of Commitment	If the Project is approved, it is proposed that Wollongong City Council would surrender existing development consents of relevance to the Project site. This does not include the existing development consent for the MRF, which is not affected by the Project	Refer to Schedule 3; Condition 7.	Non-compliant

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation
Statement of Commitment	Wollongong City Council commit to: Screen planting with dense tall tree planting on natural ground would be used to block views to the site, particularly from adjoining residences.	Landscape strategy is documented in the LEMP. Section 4 of the Landscape Strategy states that "the proposed planting along sections of the site boundary is intended to provide visual screening of the landfill operations from adjoining properties. In order to fulfil this function, the planting will need to be carried out in advance of landfill operations. A minimum of 5 years growth will be required to provide the intended visual screening. WCC did not provide evidence of where trees have been planted for screening purposes. Minutes of the Whytes Gully Reference Group meetings on 24 May and 22 November 2017 indicated questions from members as to why screening trees had not been planted at the boundary of the site.	Non-compliant **Recommendation:** WCC to conduct screen planting with dense tall tree planting on natural ground to block views to the site, particularly from adjoining residences.

Table 8-2 - Non-Compliant and Not Verified Conditions – Environmental Protection Licence 5862

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation
L2.1	For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	Based on the monthly reports posted in WCC council and annual returns to EPA, there were 3 occurrences of non-compliances reported to EPA since 2013 against this condition: • L2.1/L2.4 - Exceed TSS Concentration Limit at LDP1 (x1, minor) after heavy rainfall event on 25/08/2015 (approximately 150mm over 24hours). Action taken by licensee. EPA has written to licensee regarding non-compliance and relevant action. (1 occurrence); • L2.1/L2.4 -Exceed limit for TSS at LDP 1 (minor) on 2 occasions due to high intensity rainfall events in June and July 2016. The licensee is addressing non-compliances. EPA has written to licensee regarding non-compliance and relevant action. (2 occurrences). Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. WCC consider these are historic results and that it has implemented amended controls to eliminate recurrence. WCC consider that controls implemented are performing as designed. Specifically, a Wet Weather and Stormwater Management Work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. Since the implementation of the new work instruction, there were no further reported elevated TSS discharges. There was no reported exceedance to the water/land concentration limits since July 2016. Based on the exceedences of the criteria as reported, WCC is assessed as Non compliant with this condition. Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. It was not evident that these events were reported to the EPA based on documents sighted.	Non-compliant **Recommendation:** It is recommended that WCC continue to monitor the effectiveness of the controls defined in the Wet Weather and Stormwater Management work instruction and implement additional mitigation measures as required.
L4.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.	Refer to Sch 4 Condition 23.	Not Verified Refer to recommendations made in the MCoA Checklist for Conditions 23 and 26; Schedule 4.
O6.8	The licensee must not exhume any landfilled waste unless approved in writing by the EPA.	The process of exhumation of the landfill is defined in the LEMP. Two-2 Penalty Notices (1521880 and 1521881) were raised on 22 May 2014 regarding exhumation of waste: o O6.4 -Non-compliance with Condition O6.4 - The licensee must not exhume any landfilled waste unless approved in writing by the EPA. Penalty Notice issued. WCC consider this to be an historic incident for which Council has implemented amended controls to eliminate recurrence. Controls implemented are performing as designed. WCC has not exhumed any landfilled waste unless approved in writing by the EPA since this event in 2014. An approval for exhumation of waste for the removal of rainflap was granted in October 2017. Given the events in 2014, WCC were not compliant with this condition at this time. Since May 2014 it is considered that WCC has been compliant with the condition hence no recommendation is made.	Non-compliant

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation
O7.3	Disturbed areas must be provided with separate water quality controls for the treatment of runoff containing suspended or turbid pollutants.	During the audit inspections, it was observed that generally disturbed areas within the operation facilities were spray grassed or covered with geofabric. Swales or drainage were generally lined with gravel, and sand bags or check dams were also place within the swales. However, limited erosion and sedimentation controls were noted within the construction areas of cells 2 and 3 and at the newly constructed leachate pond (see photos below). The lack of controls in these areas was reported by WCC to have been from recent construction activities conducted in and adjacent to the drainage line. Issues on this area were also noted in the Whytes Gully Inspection November 2017 Report prepared by the WCC surveillance officer from the public works division. Photo below was taken at the outlet of stormwater swale from the construction of Cell 2 & 3. Note that there was no sediment control prior to the entry to the culvert. WCC noted that since the site inspection, it has and continues to address these issues with the construction contractor on the site. A stop work order was issued in October 2017 and rectification implemented before work could recommence. Performance management of the contractor is ongoing.	Non-compliant **Recommendation:** That WCC and its contractors review the processes for installation of ERSED controls in construction areas and ensure that controls are effective and placed promptly after works are completed.
R4.1	The licensee must maintain a daily log and record the following data of fires at the site: a) Time and date when the fire was deliberately started or reported. b) Whether the fire was authorised by the licensee, and, if not, the circumstances which ignited the fire. c) The time and date that the fire ceased and whether it burnt out or was extinguished. d) The location of fire (eg. clean timber stockpile, putrescible garbage cell, etc). e) Prevailing weather conditions. f) Observations made in regard to smoke direction and dispersion. g) The amount of waste that was combusted by the fire. h) Action taken to extinguish the fire.	Two fires were recorded in the WHS records management system. Register of events were provided for WGRRP from 2013 to 2017. The fires occurred on 31-7-2013 and 21-8-2013. The system did not report fires after this event. The system indicated that the first fire was reported to the EPA, and a separate email indicated that the second fire was also reported to the EPA. The data provided to auditors did not address all of the requirements of the conditions a to h. As such, Auditors were not able to verify compliance with this condition.	Not Verified **Recommendation:** It is recommended that WCC record all details as defined in the condition relating to fires at the site and ensure that the EPA are notified of details of fires occurring on site as defined in the condition.
R4.2	The licensee or its employees or agents must notify the EPA in accordance with conditions R2.1 and R2.2 of all fires at the premises as soon as practical after becoming aware of the incident.	See response to above condition R4.1.	Not Verified

8.1 Additional Recommendations (not related to non-compliances)

The following table has been reproduced from **Appendix A and Appendix B**. For details on the requirement, and for further discussion of the issue, please refer directly to the table in **Appendix A and Appendix B**. Many recommendations are based around continuous improvement opportunities identified during the audit and do not necessarily represent immediate potential non-compliance issues.

Table 8-3 – Opportunities for Improvement for Conditions Considered Compliant for Improved Compliance and Continuous Improvement

Approval & EPL Condition Number	Rec #	Opportunities for Improvement (OFIs)
Project Approval MCoA 11_0094		
Sch 4 Condition 5	OFI 1	The effectiveness of the resource and recovery measures was not able to be fully reviewed during this audit and satisfaction of the Director General was not evident. It is recommended that WCC review the effectiveness of the resource recovery measures to fully meet this condition.
Sch 4 Condition 7g	OFI 2	This audit did not fully review the implementation of all SOPs developed by WCC. It is recommended that WCC conduct an internal audit/review of all the SOPs to ensure ongoing implementation and compliance.
Sch 4 Condition 7h	OFI 3	It is recommended that WCC conducts an audit of filling activities regularly to demonstrate that it is being implemented to comply with this requirement and the EPL.
Sch 4 Condition 15g	OFI 4	It is suggested WCC consult with DPE so as to define what is required to obtain or demonstrate *"satisfaction of the Director General"* for surface water management.
Sch 4 Condition 18b	OFI 5	Ensure ERSED controls are replaced promptly after works near drainage lines and stabilise the bank of the sediment pond near the outlet and.
Sch 4 Condition 27	OFI 6	That WCC conduct a review of implementation of the LEMP and SOPs in respect to tipping areas to demonstrate compliance with the figures in Table 5 for the areas of tipping face; daily cover; and 90 day cover.
Sch 4 Condition 32	OFI 7	Ensure all plant use low frequency reversing alarms.
Sch 4 Condition 33e	OFI 8	It is recommended that WCC conducts a review of the implementation of the noise management plan for operations and construction to ensure compliance to this condition. WCC to address the requirement of the condition to *"evaluate and report on the effectiveness of the noise management system".*
Sch 4 Condition 46	OFI 9	WCC conduct a review of their capability to manage fire risk and maintain adequate fire-fighting capacity on site.
Sch 5 Condition 2	OFI 10	The Construction Environmental Management Plan has not been updated since 2013. It is suggested that WCC review and update the plan to ensure its alignment with changes on site; and relevant EPL variations.
SOCs	OFI 11	It is suggested WCC consider better advising of the complaints line to Council on Whytes Gully related web pages and other media, to make it more transparent

Approval & EPL Condition Number	Rec #	Opportunities for Improvement (OFIs)
		how complaints to the facility can be made.
Environmental Protection Licence 5862		
M5.2	OFI 13	It is recommended that WCC review the on line complaints process on the WCC website to specifically include a means of making a complaint for Whytes Gully direct to WCC, rather than the EPA. It is recommended that WCC improve signage at the site to better advertise the complaints line telephone number so that the impacted community knows how to make a complaint.

Table 8-3 - Recommendations Relating to Management Plans

Document or Area of Recommendation	Recommendations
LEMP and CEMPF	WCC review approaches to site based management systems and the integration of these with the LEMP. WCC review current approaches as defined in the LEMP and CEMPF against the requirements of formal EMS Standards (such as a Gap Analysis) to ascertain what current approaches may be missing in terms of an overall system approach, and whether WCC could benefit from implementation of such approaches. WCC conduct regular audits of the implementation and adequacy of the LEMP; Contractors CEMPs; the CEMPF and other WCC systems to ensure ongoing implementation and effectiveness of controls.
LEMP	That the LEMP and associated sub-plans be reviewed and updated as required and ensure their effectiveness and adequacy. Technical aspects of the review should be undertaken by suitably qualified people. That the LEMP update include a rationalisation of documents appended to the LEMP to make it a more manageable sized document and to remove aspects of the document now not considered relevant. This could include that various design related documents being uploaded to the WCC website separately, instead of being appendices to the LEMP. The LEMP and associated subplans are required to be posted on the WCC website. That key requirements of the LEMP be reflected in operating level systems and procedures (see recommendations under Section 7.1).
LEMP and CEMPF	That the CEMPF and its associated sub-plans be reviewed and updated as required and ensure implementation and effectiveness on construction works. The CEMP and it's associated subplan be posted on the WCC website. (noted this recommendation was implemented during the audit report finalisation).
Vegetation Management Plan	Update the Vegetation Management Plan with the findings of the review of the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2017).

9 Limitations of Report

MCW Environmental Consulting Pty Limited (MCW Environmental) has conducted this Independent Environmental Audit (IEA) and generated this report in accordance with the usual care and thoroughness of the consulting profession for the use of Wollongong City Council Whytes Gully Landfill Extension Project and only those third parties who have been authorised in writing by MCW Environmental to rely on this Report.

It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this Report. This IEA report did not assess any aspects relating to safety at the site.

The IEA Report is prepared in accordance with the scope of work and for the purpose outlined in the MCW Environmental Proposal dated **July 2017** and the signed contract executed between MCW Environmental and Wollongong City Council.

Where this IEA Report indicates that information has been provided to MCW Environmental by third parties, MCW Environmental has made no independent verification of this information except as expressly stated in the Report. MCW Environmental assumes no liability for any inaccuracies in or omissions to that information.

This IEA Report was prepared between 11 September 2017 and 29 March 2018 and is based on the conditions encountered and information reviewed at the time of the site visits on 11 September and 27 November 2017. MCW Environmental disclaims responsibility for any changes that may have occurred after the site visit.

This IEA Report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This IEA Report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

Except as required by law, no third party may use or rely on this IEA Report unless otherwise agreed by MCW Environmental in writing. Where such agreement is provided, MCW Environmental will provide a letter of reliance to the agreed third party in the form required by MCW Environmental.

To the extent permitted by law, MCW Environmental expressly disclaims and excludes liability for any loss, damage, cost or expenses suffered by any third party relating to or resulting from the use of, or reliance on, any information contained in this IEA Report. MCW Environmental does not admit that any action, liability or claim may exist or be available to any third party.

Except as specifically stated in this section, MCW Environmental does not authorise the use of this IEA Report by any third party.

It is the responsibility of third parties to independently make inquiries or seek advice in relation to their particular requirements and proposed use of the site.

Appendix A
Compliance Table – MCoA 11_0094

Appendix A

Minister's Conditions of Approval 11_0094 dated 3 April 2013 for Whytes Gully Landfill Extension Project

Table A: Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		SCHEDULE 3 ADMINISTRATIVE CONDITIONS			
		OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT			
Sch 3	1	The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may results from the construction, operation or decommissioning of the Project.	Interview with Waste Manager and Construction Manager and Site inspection 11 September and 27 November 2017 Documents and records provided to auditors (Refer to Appendix D)	WCC have developed the environmental management plans LEMP and CEMPF with associated subplans and procedures for Whytes Gully Landfill Extension Project as per the requirements of Minister's Conditions of Approval defining the mitigation measures to prevent and or minimise any harm to the environment during construction and operations. These plans were also approved by the Department of Planning for implementation. Stage 1A & 1B construction was completed in 2014. Operation of the Stage 1 Cell commenced in 2014 and was 70% filled at the time of this audit. Based on information provided by WCC, and observations made during site inspections, and subject to the findings in this report, WCC has generally implemented the reasonable and feasible measures to prevent and/or minimise any harm to the environment. There were no reported incident that cause material harm to the environment. Where non compliances to the conditions of approval have been identified, these are discussed below within this table and in the main body of the report.	Compliant, (subject to the findings for specific conditions as defined in this table).
		TERMS OF APPROVAL			
Sch 3	2	The proponent shall carry out the project generally in accordance with the:			
		a) EA;		The requirements of the Environmental Assessment (EA) have been incorporated into the conditions of approval. This audit has focused on the review of compliance with the requirements of the Minister's Conditions of Approval. It was noted that the LEMP and CEMPF were developed as per the requirements of the EA. The requirements of the EA are also referenced in MCoA conditions which have been assessed within this checklist. While Auditors have conducted a high level review of the requirements of the EA, the audit did not comprise a detailed assessment against the EA. It is considered the project is "generally carried out in accordance with the EA" subject to the comments made throughout this checklist.	Compliant
		b) PPR;		The requirements of the Preferred Project Report (PPR) have been incorporated in the conditions of approval. Refer to the following conditions for the assessment of this condition.	Compliant

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
				While Auditors have conducted a high level review of the requirements of the PPR, the audit did not comprise a detailed assessment against the EA. It is considered the project is "generally carried out in accordance with the PPR" subject to the comments made throughout this checklist.	
		c) Statement of Commitments (Appendix 1);		Refer to Appendix 1 of this checklist for the compliance status on the requirements of the Statement of Commitments. Overall it is considered the project is "generally carried out in accordance" with the Statement of Commitments other than identified otherwise in this checklist.	Compliant
		d) Site layout plans and drawings in EA (Appendix 2); and	Environmental Assessment Report	Based on the site layout in EA the extent of the landfill works only covers the following Lot and DP numbers: - Lot 1 DP240557 (it appears this should be Lot 2 DP240557) - Lot 501 DP1079122 - Lot 502 DP1079122 - Lot 53 DP1022266 The following lots are also covered under the MCoA and EPL premise map but these are not included in the scope of this audit and were reported by WCC to be not part of Whytes Gully Landfill Extension Project: - Lot 52 DP 1022266 is leased by Visy Recycling - Lot 51 DP 1022266 was noted not to be under Whytes Gully Landfill management. **OFI: WCC should consider the compliance implications of the approval instrument 11_0094 covering areas not under the direct control of the landfill operations (Lot 52 DP 1022266 and Lot 51 DP 1022266) and under the control of other entities. The audit did not consider activities or operations on these Lots nor did it consider any related compliance implications.**	Compliant
		e) Conditions of this approval.		Refer to the following review of conditions. This audit focussed on the review of compliance to the conditions of approval and implementation of LEMP and CEMP.	
Sch 3	3	If there is any inconsistency between the above, the conditions of this approval shall prevail to the extent of any inconsistency.		The lot number noted in the EA Figure 6.1 is Lot 1 DP 240557, however in the MCoA and EPL it is Lot 2 DP 240557. The lot and DP noted in the MCoA and EPL will prevail.	Note
Sch 3	4	The Proponent shall comply with any reasonable requirements of the Director-General arising from the Department's assessment of: a) Any reports, plans, strategies, programs, or correspondence		WCC have received approval for the various management plans required of the project approval. WCC did not identify or provide any documents that included	Compliant

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		that are submitted in accordance with this approval; and b) The implementation of any actions or measures contained in these reports, plans, strategies, programs, or correspondence.		outstanding requirements from the Department's assessment of plans and documents as listed. On this basis WCC are deemed compliant with this condition.	
		LIMITS OF APPROVAL			
Sch 3	5	The Proponent shall ensure no more than 180,000 tpa of waste is accepted at the landfill in any calendar year.	Whytes Gully tonnage data - waste and recycling Weigh bridge data TPA Weighbridge Data – to March 2018 Operational Purpose Deduction – Certificate	WCC report tonnages to the EPA on a monthly basis as a requirement of Council's Environment Protection Licence. The EPA review this data monthly and audit the data as required. The tonnages are collected via a weighbridge system that is calibrated annually. Additionally, this information is verified via stocktake surveys completed for the site which are executed by a registered surveyor. WCC provided a Whytes Gully tonnage data spreadsheet – waste and recycling register to record the type of waste received, recycled and disposed offsite. While this was provided and reviewed, the auditors were not able to establish how the total tonnage accepted at the landfill in any calendar year is calculated by WCC. WCC provided a further spreadsheet (TPA Weighbridge Data provided 29-3-18) that summarised the waste tonnages for 2014 to 2018. This data provided a total of waste accepted at the facility, and subtracted the following: wastes taken off site including green waste; Operational Purpose Deduction (materials bought to site for other purposes e.g. construction materials); and non waste related items e.g. consumable products. The data provided by WCC reported the following totals of waste (in tonnes per annum) to landfill was: 2014 was 54,743 tonnes; for 2015 was 120,330 tonnes; 2016 was 106,981 tonnes; and for 2017 there was 133,144.04 tonnes recorded as going to landfill. WCC provided an Operational Purpose Deduction – Certificate from the EPA for the construction of Landfill Cells 2 & 3 and Leachate Pond/Drainage. This provided an exemption of 167,649.40 tonnes of materials. Based on the data supplied by WCC and the Operational Purpose Deduction applied by WCC, the data indicates compliance with the condition. MCW Environmental has not verified; nor completed an independent check on the methodology used by WCC to measure and calculate the waste numbers as reported.	**Compliant**
Sch 3	6	This approval does not authorise any landfilling activities or new landfill cell to be constructed or operated within the area marked Stage 4-2B in the PPR and shown in the staging plan in Appendix 3 of this approval.	Site inspection	Observations during the site inspection confirmed that no landfilling or construction has commenced in the area marked Stage 4-2B. The photo below of the site taken during the audit shows no activities in the Stage 4-2B area.	Compliant

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SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
					
		SURRENDER OF EXISTING DEVELOPMENT CONSENTS			
Sch 3	7	Within 12 months from the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall surrender the development consents identified in Table 1 in accordance with Section 75YA and 104A of the EP&A Act.	Surrender of Development Consent documents dated 13 March 2018 Applications to surrender Development Consents dated 7 February 2018	At the time of the audit site inspections, WCC could not demonstrate that they had surrendered the previous development consents. On 29 March 2018, WCC provided documents showing that WCC surrendered all of the leases detailed in Table 1 on the leases on 13 March 2018, except for DA 1996/8256 and DA-1996/6256. The surrender of leases followed an application to surrender the leases dated 7 February 2018. One the basis that the Development Consents were not surrendered within 12 Months of the date of the Approval (being 3 April 2013); and that surrender of two development consents may be outstanding; WCC is considered non-compliant with this condition. **Recommendation:** Ensure that development consents DA 1996/8256 and DA-1996/6256 are surrendered in accordance with Condition 7: Schedule 3.	**Non-compliant**
Sch 3	8	To the extent of any inconsistency between the consents identified in Table 1 and this approval, this approval shall prevail.	Conditions of Approval 11_0094	Previous DA's were not provided to the Auditors hence this condition was not assessed.	Noted - Not Assessed
		TRANSITIONAL ARRANGEMENTS			
Sch 3	9	All existing environmental management plans that apply to the site under those DAs listed in Table 1 of this Schedule shall continue to be fully applied until replaced under this approval.	LEMP Sep 2014 CEMPF August 2013	WCC reported that during the transition period until the approval of the Landfill Environmental Management Plan (LEMP) in 2014 and Construction Environmental Management Plan Framework (CEMPF) in 2013, all existing management plans prevailed. This audit has not considered the management plans under the DA's listed in Table 1. Due to the time elapsed since the commencement of the LEMP and hence replacement of the former management plans, it was not possible to verify whether the plans were in place until replaced under this approval.	**Not Verified**

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		STRUCTURAL ADEQUACY			
Sch 3	10	The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures are constructed in accordance with the relevant requirements of the BCA. *Notes:* • *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.* • *Part 8 of the EP&A Regulation sets out the requirements for the certification of the Project.*	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015.	WCC reported that no new permanent buildings have been constructed under the approval. The project has comprised the construction of new landfill cells. At the time of this audit New Cell Part 1A and 1B were completed (in 2014). Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence against this condition. Auditors have relied on the Completion Reports and Practical Completion Certificates completed by third parties to demonstrate compliance with this condition for Part 1A and 1B of the landfill. No further assessment has been undertaken in respect of this condition.	Compliant
		Retaining Walls			
Sch 3	11	The Proponent shall ensure that: a) all retaining walls are designed by a suitably qualified civil or structural engineer and are detailed on engineering plans which meet the requirements of WCC; and b) following the completion of construction of any retaining wall, a certificate from a suitably qualified civil or structural engineer is obtained to verify the structural adequacy of the retaining wall.		WCC reported that no retaining wall was included in Landfill Cell Part 1A & 1B. No retaining walls were observed during the site inspections.	Not triggered
		DEMOLITION			
Sch 3	12	The Proponent shall ensure that all demolition work is carried out in accordance with Australian Standard AS 2601:2001: The Demolition of Structures, or its latest version.	Work Plan Methodology Demolition dated 15-1-2014 – Blackwell Brothers	Demolition works were completed in 2013-2014. A Work Plan Methodology Demolition dated 15-1-2014 was sighted for the demolition of the weighbridge and the office structures. The work pan referenced the Australian Standard AS 2601:2001: The Demolition of Structures, in addition to a number of other relevant standards and codes. On this basis WCC are considered compliant with this condition.	Compliant
		OPERATION OF PLANT AND EQUIPMENT			
Sch 3	13	The Proponent shall ensure that all plant and equipment used for the project is: a) maintained in a proper and efficient condition; and b) operated in a proper and efficient manner.	Plant Daily Inspection Matrix Whytes Gully Waste Asset Maintenance Records John Deer Loader Maintenance Daily site inspection - Leachate Ponds; Ammonia Plant; Settling Ponds & weighbridge	WCC provided the plant and equipment maintenance record register as evidence of compliance for this requirement. An example of Daily site inspection - Leachate Ponds; Ammonia Plant; Settling Ponds & weighbridge was provided as evidence dated 21/08/17. An example of Waste Asset Maintenance Records 2015 included the following waste assets:	Compliant

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SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
				- AE79SP Komatsu PC 220-7 (P94401) - IVECO STRALIS 8x4 Hook truck (93701) - BG91EH Caterpillar Loader 950H (P95212) - Caterpillar Compactor 836H SERIES (P94242) - Water pump at Whytes Gully Tip 94/95 year Given the extent of the nature of this condition, not all aspects of the maintenance and operation of plant and equipment used on site was able to be assessed. The assessment has been based on the documents provided and listed and based on the minor nature of the few incidents that have been reported to have occurred on site.	
		PROTECTION OF PUBLIC INFRASTRUCTURE			
Sch 3	14	The Proponent shall: a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.		WCC reported that no public property damage occurred during the audit period.	Not Triggered
		STAGED SUBMISSION OF PLANS OR PROGRAMS			
Sch 3	15	With the approval of the Director-General, the Proponent may submit any plan or program required by this approval on a progressive basis.	June 2012 VOLUME I - Environmental Assessment - Whytes Gully New Landfill Cell	The staging of the project was defined in the Environmental Assessment that was submitted to DPE. The Stage 1 Plans have been submitted and approved by DPE comprising the LEMP and CEMPF and their associated subplans. Stage 2 commenced in March 2017 and will be completed mid-2018.	Noted
		SCHEDULE 4 SPECIFIC ENVIRONMENTAL CONDITIONS			
		WASTE			
		Restrictions on Receipt, Classification and Disposal			
Sch 4	1	The Proponent shall only receive waste on site that is authorised for receipt by an EPL	Whytes Gully tonnage data - waste and recycling Weigh bridge data Work Place daily inspection - Small Vehicle Transfer Station - 9112014 -30112014 Daily inspection Tip Face Example rejected loads report Sept 2016 - Sept 2017	Based on the waste and recycling data supported with the procedures, the landfill only receives waste that is authorised under EPL. The weigh bridge check point was also installed with camera as an additional mitigation measure to ensure wastes accepted are in accordance with the EPL authorised wastes. Excavator and compactor site personnel are also trained to identify materials that are not acceptable at the landfill. Inspection during tipping is also conducted. The auditors did not do any specific inspection to assess compliance with this criteria due to access restrictions at the tip face. Full verification of compliance with this condition is	Compliant

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				not considered practicable as part of the audit. 	
Sch 4	2	The Proponent shall ensure that any waste generated on the site during construction is classified in accordance with the EPA's Waste Classification Guidelines and disposed of to a facility that may lawfully accept the waste.	Records of offsite disposal of waste during construction -Bingo Fill Disposal summary Whytes Gully tonnage data - waste and recycling	The process for waste classification is defined in the in the CEMPF. Construction wastes such as concrete, scrap metals, asphalts and hazardous waste (i.e. asbestos, contaminated soil) were classified and went offsite to a licence facility. The Bingo fill disposal summary that included construction demolition wastes was provided as evidence of compliance to this requirement.	Compliant
		Resource Recovery			
Sch 4	3	The Proponent shall implement all reasonable and feasible measures to recover resources from the waste stream to the satisfaction of the Director-General.	WOLLONGONG WASTE AND RESOURCE RECOVERY STRATEGY 2022 ACTION PLAN WWRRP flyer to community Whytes Gully tonnage data - waste and recycling Register	Flyers are provided to community on proper waste sorting prior to disposal to landfill and emphasis cost savings on disposing to landfill. The recycling area was set up onsite for residential/community drop off. Tonnage data of waste and recycling register was provided as evidence. WCC plan to recover methane gas in the future. WCC were not able to provide evidence of satisfaction by the Director General with this condition. A full assessment of what reasonable and feasible comprises, in relation to this condition, has not been undertaken as part of this audit.	Compliant
		Screening and Acceptance			
Sch 4	4	The Proponent must: a) implement auditable procedures to: • ensure that the site does not accept wastes that are prohibited; and • screen incoming waste loads; and b) ensure that:	Waste Services SOP - Weighbridge Procedure Asbestos Detection & Treatment at Whytes Gully Safe Operating Procedure Placement and Handling of Special Waste -	The procedures listed in the "Evidence Source" column were developed and implemented at the site. **Implementation Evidence:** Prior to entering the landfill, all trucks and cars pass through	Compliant

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		• all waste that are controlled under a tracking system have the appropriate documentation prior to acceptance at the site; and • staff receive adequate training in order to be able to recognise and handle any hazardous or other prohibited waste.	Whytes Gully Waste Services Daily Inspection -Tip Face - Whytes Gully Waste Depot Daily Inspection - Small Vehicle Transfer Station - Whytes Gully Waste Depot Training and Development - Risk Management - Assessment - Waste Services Required Training Matrix Accepting eWaste under the product stewardship program Procedure ewaste, mattresses and tyres, storage and removal – WWRRP Whytes Gully Weighbridge Cash Handling procedures Compliance checklist Whytes Gully Waste Depot weighbridge cash handling procedures Capture Training Records - Sandra Belanszky as example Example rejected loads report Sep 2016 - Sep 2017 SOP - Collection & Removal of bonded asbestos under 10 mtrs	a weigh bridge and receive dockets. A camera is installed at the weigh bridge as an additional check for waste prior to entering landfill. Staff were trained and sent to TAFE for a waste management course. A Training Register was provided as evidence of records for training. Daily Inspection – Tip face template was provided. A sample of completed forms were provided for review. Daily Inspection – small vehicle transfer station template was provided. A sample of completed forms were provided for review. There was no reported incident of illegal dumping to date. Given the nature of receiving wastes in enclosed trucks, it is not possible to verify this condition with certainty. Auditors have not conducted any on site assessment to test compliance with this condition. However, based on the records provided e.g. Example rejected loads report Sep 2016 - Sep 2017, this implies that WCC has demonstrated it has implemented practices in relation to accepting and rejecting waste at the site.	
Monitoring					
Sch 4	5	The Proponent shall prepare and implement a Waste and Resource Recovery Monitoring Program for the site to the satisfaction of the Director-General. This program must:			
		a) be prepared in consultation with the EPA;	Landfill Environment Management Plan, September 2014	Section 1.3 of LEMP presented the records of consultation with DPE and EPA.	Compliant
		b) be approved by the Director-General prior to the commencement of operation;	DPE approval letter for LEMP dated 11/12/14.	Record of DPE approval letter for LEMP was provided to the auditor as evidence of compliance to this requirement.	
		c) detail the screening and acceptance procedures required by Condition 4 above;	Whytes Gully tonnage data - waste and recycling Register	The Section 5.2 of LEMP defined the waste screening process.	
		d) monitor: • the quantity, type and source of waste received on site; and • the effectiveness of the resource recovery measures (see Condition 3 above).	Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014)	Defined in operations overview Section 3 and Gate house operations Section 5 of LEMP. Waste recycling process is defined in Section 5.4 of LEMP.	
		This program must be documented in the Landfill EMP (see Condition 3 in Schedule 5).	Whytes Gully tonnage data - waste and recycling	The Waste and Resource Recovery Monitoring Program is defined in Section 5 of LEMP. This section also defined the inspection, monitoring and maintenance schedule. **Implementation Evidence:**	

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				The evidence of implementation provided largely comprised the Whytes Gully tonnage data - waste and recycling wherein all waste data including the recycling tonnage are recorded. Screen shots of Strategic Waste Research Filing Container was also provided as evidence of WCC demonstration of waste and recovery monitoring program meeting and consultation for improvement and research of new technology. Brochures are also provided to the community on how to proper segregate and recycle wastes prior to disposal to the landfill. A separate recycling area was also set up for community to drop off any recyclable waste prior to dumping into the landfill. The Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014). Project Plan – Increased Diversion of Domestic Waste EOI and Tender Trim Ref: Z15/248910 **OFI: The effectiveness of the resource and recovery measures was not able to be fully reviewed during this audit and satisfaction of the Director General was not evident. It is recommended that WCC review the effectiveness of the resource recovery measures to fully meet this condition.**	
			LEMP		
Trade Waste Agreement					
Sch 4	6	From the date of this approval, the Proponent shall ensure that a Trade Waste Agreement is in place with Sydney Water for as long as leachate is discharged to sewer.	Landfill Environment Management Plan Section 7.6 MONITORING LANDFILL SITES MASTER Whytes Gully analytical data WWARRP - Sydney Water - Trade Waste Agreement Consent No. 11205 - August 2017	The trade waste agreement under Sydney Water Consent 11205 was in place and parameters required for monitoring were monitored. Data of monitoring were provided in register MONITORING LANDFILL SITES MASTER Whytes Gully analytical data. Auditors did not complete an assessment of compliance with the Trade waste Agreement.	Compliant
Landfill Operations					
Sch 4	7	Unless the Director-General agrees otherwise, the Proponent shall:	Landfill Environment Management Plan Section 6.0 defined the landfill filling operations SOP Z13/54468 Placement and Compaction of Waste EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017	The landfill operations are defined in Section 6 of LEMP.	Compliant
		a) minimise the exposed or cleared areas at the landfill;		The cleared areas of the landfill appeared to be what was required to construct the landfill as relevant at the time of the site inspection.	
		b) progressively revegetate all completed areas of the landfill and stabilise any exposed areas with intermediate cover of at least 0.3 m that are not required for operational purposes for a period greater than 90 days;		There were no completed areas of the landfill at the time of the inspection (relevant to the current approval). Intermediate cover was observed on areas not required for operational purposes at the time of the audit.	

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				 The site of the oldest cell is now covered with temporary capping and grass cover.	
		c) ensure intermediate cover areas are revegetated with grasses;		Intermediate cover areas were revegetated with spray grass.	
		d) limit the size of the active tipping face area, waste relocation area, daily cover and 90-day cover areas to minimise dust and odour (see Table 5 of this approval);		The tip face was limited in size and daily cover was placed with compaction of waste implemented as per the SOP Z13/54468. See photo above.	
		e) minimise the tracking of mud and waste from the site on public roads;		No visual tracking of mud from site onto public roads was observed during site audit.	
		f) fill the landfill cells in a systematic manner;		Landfill operational cells were filled in accordance with the standard operating procedure based on the relevant benchmark techniques EPA (1996). At the time of the inspection the waste was being placed systematically up the hill on top of the Piggyback Liner.	
		g) maximise landfill compaction rates;		WCC has developed the SOP Z13/54468 Placement and Compaction of Waste which was claimed used on site. **OFI: This audit did not fully review the implementation of all SOPs developed by WCC. It is recommended that WCC conduct an internal audit/review of all the SOPs to ensure ongoing implementation and compliance.**	**OFI**
		h) cover the active landfill area with at least 0.15 m of soil (or a suitable alternative material) at the end of daily waste disposal and compaction activities;		Section 6.5 of LEMP defined the covering of waste as per this requirement and EPL requirement. WCC reported that a cover of fill of 0.15m is placed as daily cover; or steel plates are placed over the active waste filling zone each day. **OFI: As above, it is recommended that WCC conducts an audit of filling activities regularly to demonstrate that it is being implemented to comply with this requirement and the EPL.**	**OFI**
		i) progressively cap the landfill cells with the approved capping		No areas were available for capping at the time of the site	

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		layer, which shall comprise the following (from top to bottom), or an EPA approved alternative: • 0.5 m to 1 m revegetation layer; • geocomposite drainage system with geotextile covers to prevent clogging of the system from sediment migration; • linear Low-Density Polyethylene (LLDPE) geomembrane liner to prevent infiltration of water into the landfilled waste; • 0.2 m clay rich bearing layer to form a low permeability and smooth base for geomembrane liner placement; • 0.3 m intermediate cover remaining from the landfill operation; • landfill gas collection trenches underneath the cap, consisting of gravel aggregate and perforated collection pipes connected to an active landfill gas collection system; and		inspection, hence this condition was considered to be not triggered. Procedures for capping are included in the LEMP. Large areas had been temporarily covered for maintenance until required in the future.	
Sch4	7	j) revegetate the covered landfill cells following the capping of each cell and once they reach their final design height.	Procedure defined in LEMP Section 6.5.	The process for revegetation of the covered landfill cells following the capping of each cell and once they reach their final design height is defined in LEMP Section 6.5. No areas had been capped at the time of the inspection.	Not triggered
Cover Material					
Sch 4	8	The Proponent shall ensure that all daily waste cover material used on site is ENM, VENM and/or alternative daily cover, as approved in writing by the EPA.	SOP Acceptance of VENM at Landfill IW - Major Projects - Environment - Fowl~fication Virgin Excavated Natural Material IW - Major Projects - Environment - Fowl~ for the Acceptance and Disposal IW - Major Projects - Environment - Fowl~VENM at WWRRP - Soil Classification	The procedure for acceptance of VENM in landfill defines the process to meet the condition. WCC noted that cover material was sourced from ENM/VENM. SOP for acceptance of ENM/VENM provided. Example of records of waste classification and certification of ENM/VENM where provided as evidence.	Compliant
Litter Control					
Sch 4	9	The Proponent shall:			
		a) implement suitable measures to prevent the unnecessary proliferation of litter both on and off-site, including the installation and maintenance of a mesh fence of not less than 1.8 metres high around the site; and	Waste SOP - Wind blown litter collection Whytes Gully Extract from Trim (records management system) Community Service Attendance Records - Litter collection	Fencing was installed around the boundary of the landfill. Cleaning of litter around the perimeter was reported to be conducted by WCC on a campaign basis at least weekly. WCC reported that daily inspections are carried out that includes litter inspections. A template form including the item "workplace free of litter and obstructions" was sighted. During the site inspection significant quantities of litter was observed across the site, generally caught in obstructions such as shrubs, trees and fences and also in and around landfill areas. Off site areas were not accessible to inspect. Minutes of the 2017 Whytes Gully reference group (22	**Non-compliant**
		b) inspect daily and clear the site (and if necessary, surrounding area) of litter on at least a weekly basis.			

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				November 2017) indicated that residents advised *"that there is a lot of rubbish around, In particular in Reddalls Road, from the corner of the tip to the car yard. One member also mentioned that the area near where he lives there are plastic bags up in the trees."* On the basis of site observations during both site inspections, and the feedback from community representatives at the November Whytes Gully reference group, that WCC are not compliant with this condition and that there is significant opportunity to reduce the amount and extent of litter at the site (and off site) through better controls or through more frequent litter reduction campaigns. It is noted that the condition requirement to "clear the site" of litter is very challenging given the extent of plastic bags etc disposed of at the landfill on a daily basis. **Recommendation: Increase the effectiveness of litter reduction controls and of litter reduction campaigns to reduce on and off site litter.** **OFI: Reconsider with DPE what would be acceptable in terms of "clear the site of litter" so as to be able to comply with this condition.**	
Lining System					
Sch 4	10	Prior to the commencement of any landfilling over existing landfilled waste, the Proponent must construct a Piggyback Liner System over these surfaces to the satisfaction of the EPA. The Liner System shall include the following (from bottom to top), or an EPA approved alternative: a) pipework and gravel trenching to collect and vent landfill gas from the underlying waste to minimise the risk of uncontrolled lateral migration of gas and uplift pressure on the liner; b) a foundation or bridging layer at least 500 mm thick comprised of clean, well-graded, coarse engineered fill, with geogrid reinforcement at mid-layer, to protect the liner from deformations due to settlement of the underlying waste; c) a bearing layer at least 200 mm thick comprised of compacted clay to provide a smooth surface for installation of the geosynthetic liner materials; d) a composite liner comprised of a reinforced geosynthetic clay liner (GCL) with hydraulic conductivity less than 5 x 10^{-11} m/s under a 1.5mm thick textured linear low-density polyethylene (LLDPE) geomembrane liner; e) a geocomposite leachate collection layer, incorporating a tri-planar geonet drainage core between two protection geotextiles, linked to a pipe network graded at a minimum of 2% to convey collected leachate to a sump at the low point in each cell. The geonet must have equivalent hydraulic transmissivity to a gravel collection layer with a saturated hydraulic conductivity of 1 x 10^{-3} m/s2, taking into account field conditions likely to impair the geonet's ability to convey	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015	The CQAP was provided as evidence that the lining system would be constructed as per the requirements of this condition and as per EPA approved design. Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditors as evidence of implementation of the CQAP. These reports included the design and certification of the Piggyback Liner System. The audit team did not conduct any checks of the liner system during inspections and relied Construction Completion Reports as listed to verify compliance with this condition.	Compliant

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		flow; and f) a protection layer comprised of at least 300 mm of sand or similar material to protect the geonet and liner from damage (physical and UV).			
Sch 4	11	The detailed design of the Piggyback Liner System referred to in Condition 10 of this Schedule (above) must include a settlement analysis addressing predicted settlement and lateral deformations of the underlying waste, and demonstrating, to the satisfaction of the EPA, that: a) the stresses and strains induced in the geosynthetic liner materials by the predicted settlements will be lower than allowable values, as expressed in contemporary best practice guidelines for design with these types of materials; b) there will be no grade reversal of drainage elements which could interfere with collection and conveyance of leachate; and c) where these performance requirements cannot be met when modelling the liner system configuration specified in Condition 10 of this Schedule, that augmentations to the thickness and strength of the liner elements in Condition 10 can be made to provide for long term liner integrity under the predicted maximum settlements.	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015	Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence. These reports included the design and certification of Piggyback Liner System settlement analysis. The audit team did not conduct any checks of the liner system during inspections and relied on documents listed to verify compliance with this condition.	Compliant
Sch 4	12	Prior to the commencement of any landfilling over natural surfaces, the Proponent must construct a Conventional Liner System over the base of the cell to the satisfaction of the EPA. The Liner System shall include the following (from bottom to top), or an EPA approved alternative: a) a bearing layer at least 200 mm thick of compacted clay to provide a smooth surface for installation of the geosynthetic liner materials; b) a composite liner comprised of a reinforced geosynthetic clay liner (GCL) with hydraulic conductivity less than 5 x 10^{-11} m/s under a mm textured high density polyethylene (HDPE) geomembrane liner. A cushion geotextile must be installed above the geomembrane to protect it from construction and waste-related load damage, including excessive strains introduced by indentation from the overlying gravel drainage aggregate; c) for leachate collection in areas other than over natural ridge areas, a gravel leachate collection layer at least 300 mm thick containing a pipe network graded at a minimum of 2% to convey collected leachate to a sump at the low point in each cell. The gravel must be 20 mm nominal size gravel with a saturated hydraulic conductivity of greater than 1 x 10-3 m/s2. The particle size distribution must be uniform, with maximum particle size 26.5mm, not more than 20% passing the 19-mm standard sieve aperture, not more than 10% passing the 13.2mm standard sieve aperture, and not more than 3%	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015	Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence. These reports included the design and certification of Cell based Liner System. Detailed design report was provided as evidence of compliance and as per EPA approved design. The audit team did not conduct any checks of the liner system during inspections and relied on documents listed to verify compliance with this condition.	Compliant

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		smaller than 0.075mm. A filter protection geotextile must be placed above the gravel; and d) for leachate collection over natural ridge areas, a geocomposite leachate collection layer and a protection layer, as per the requirements for these elements specified for the Piggyback Liner System in Condition 10 of this Schedule.			
Sch 4	13	The Proponent shall prepare and implement a Construction Quality Assurance Plan for the project. The plan must: a) be prepared in consultation with EPA by a suitably qualified and experienced expert whose appointment has been endorsed by the Director-General; b) be approved by the Director-General prior the commencement of construction, or at a time otherwise approved by the Director-General; c) outline the construction activities and staging; d) outline the measures taken (e.g. by independent testing, certification, monitoring and inspection) to ensure that the construction and installation of the final leachate-barrier management and collection system would be successful and quality assured;	WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1A (Doc #137625004-184-M-Rev0) 4 September 2014 WHYTES GULLY NEW LANDFILL CELL – PRACTICAL COMPLETION PACKAGE 1B (Doc #137625004-257-M-Rev0) 20 April 2014 WHYTES GULLY NEW LANDFILL CELL – NOTICE OF COMPLETION RAIN SHED CONSTRUCTION (137625004-258-M-Rev0) 21 April 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1A dated 15 September 2014 Whytes Gully Landfill New Construction Cell Construction Completion Report Part 1B dated 12 June 2015 WHYTES GULLY NEW LANDFILL CELL Construction Quality Assurance Plan (CQAP) Package 2 and 3 Landfill Cells, 20 December 2016	The Construction Quality Assurance Plan for Package 2 and 3 Landfill Cells, as listed was provided by WCC. Completion Reports and Practical Completion Certificates for Part 1A and 1B were provided to the auditor as evidence. These reports included the certification that the QAQC Plans have been implemented during construction (Section 1.1 of each completion report).	Compliant
Sch 4	13	e) specify the final leachate-barrier material selection and construction techniques; f) specify/validate of the final thickness and permeability of leachate barrier/s; and g) include an environmental-awareness site-induction program for construction personnel. This plan must be documented in the CEMP (see Condition 2 in Schedule 5).			
	SOIL & WATER				
	Surface Water Discharge Limits				
Sch 4	14	The Proponent shall ensure that all licensed surface water discharges from the site comply with the discharge limits (volume and quality) set for the project in any EPL or relevant provisions of the POEO Act.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	As noted in the annual report 2016-2017, surface water that exited the site in June 2016 and July 2016 contained suspended solids at levels above the 50mg/L concentration limit prescribed in the sites Environment Protection Licence. Downstream samples taken at the same time indicated suspended solids <50mg/L concentration limit and it was reported by WCC that there was no material harm caused by the non-compliance (as defined by Section 147 of the POEO Act 1997). To help reduce the likelihood of future non-compliances, a Wet Weather and Stormwater Management work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. Since the implementation of the new work instruction, no	**Non-compliant**

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				further sediment rich discharges have occurred. Council consider that these are historic results and that Council has implemented amended controls to eliminate recurrence, noting that controls implemented are performing as designed. Though the above situation has been reported by WCC through the EPL Annual Report for 2016-2017, the exceedance of suspended solids above the discharge limit is noted as non-compliant to this condition. **Recommendation:** Continue to review the effectiveness of corrective actions applied to site water management and address any further non compliances as required.	
Stormwater Management					
Sch 4	15	The Proponent shall: a) design and install the stormwater management and collection system (including new stormwater pond and drainage) generally in accordance Chapter E14 of the Wollongong DCP 2009;	WHYTES GULLY LANDFILL Detailed Design Report Update - Tender Package 2 and 3 Landfill Cells, 5 October 2016 Whytes Gully Stormwater Management Work Instruction July 2016	Section 7 of Detailed Design Report defined the surface water management and collection design. To enable the construction of Tender Packages 2 and 3, several additional surface water drains have been designed to manage the diversion of water from the central ridge diversion drain and cascade (constructed with Tender Package 1) and to divert stormwater along the perimeter bund of the Package 2 Piggyback Liner. As per EPL O6.11 The licensee is permitted to construct the Package 2 and Package 3 Landfill Cells in accordance with the following documents, drawings and requirements: a) "Preliminary Design Report", Golder Associates, April 2012; b) "Whytes Gully Resource Recovery Park - Detailed Design Report Tender Packages 1, 2 and 3", Golder Associates, June 2013; and c) "Whytes Gully Landfill Detailed Design Report Update - Tender Package 2 and 3 Landfill Cells", Golder Associates, October 2016. The most recent document, drawing and requirement supersedes any conflict between older documentation, drawings and requirements. Auditors have not assessed if the stormwater management system was constructed in accordance with Chapter E14 of the Wollongong DCP 2009. Based on the above discussion WCC is considered generally compliant with the condition.	Compliant
		b) ensure that the system capacity has been designed in accordance with the Blue Book Volumes 1 and 2B and Chapter E14 of Wollongong DCP 2009;		Erosion and sediment control plans for the construction work of Packages 2 and 3 were provided as evidence to this requirement. Auditors have not verified the report as compliant with the condition relating to the Blue Book, and have relied on the	

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				EPA's approval for the consideration of compliance.	
		c) ensure peak stormwater discharge rates from the site at each stage of the project do not exceed predevelopment values;		This was not able to be fully verified during this audit. However based on the site surveillance reports provided and site operations manager there was no reported recent overflow of the sediment pond. A Wet Weather Monitoring and Stormwater Management work instruction was provided. Implementation of this was validated through the site inspection records.	
		d) divert existing clean surface water around operational areas of the site;		Various clean water diversion drains were observed. A Rain flap was also installed to reduce stormwater entering the landfill area.	
		e) direct all sediment laden water in overland flow away from the leachate management system; and		Surface water or stormwater is directed to the sediment pond which is separate to the Leachate management system.	
		f) prevent cross-contamination of clean and sediment or leachate laden water,		There were no reported cross contamination or leaks of leachate water into the surface water. No evidence of cross contamination of clean water by leachate water was noted during site inspections.	
		g) to the satisfaction of the Director-General.		WCC did not provide evidence of "satisfaction of the Director General" as required of this condition.	
				OFI: It is suggested WCC consult with DPE so as to define what is required to obtain or demonstrate *"satisfaction of the Director General"* for surface water management.	**OFI**
Flooding Management					
Sch 4	16	The Proponent must prepare and implement a Flood Emergency and Evacuation Plan to the satisfaction of the Director-General. The Plan must:	117625003_287_R_Rev1 Flood Emergency Evacuation Plan LEMP Appendix N	Flood emergency evacuation plan was prepared by Golder Associate and was submitted to DPE for approval In August 2013. This was approved by DPE as part of the LEMP approval letter dated 11/12/14. Emergency Exercise was conducted at – Wollongong Waste and Resource Recovery Park Date 25/1/2017 Time 10.00am No flooding event that has been reported to date at the site, hence full implementation of the plan has not been tested. This plan is documented in LEMP Appendix N.	Compliant
		a) be prepared by a suitably qualified and experienced expert in consultation with Council;			
		b) be approved by the Director-General prior to the commencement of construction;			
		c) ensure the project is in accordance with Chapter E13 of Wollongong DCP 2009, Council's Mullet and Brooks Creeks Floodplain Risk Management Study and Plan and the NSW Floodplain Development Manual, taking into account Council's conduit blockage criteria;			
		d) identify contingency actions to be implemented in the event that the site is inundated during a major flood event to protect: • the integrity of stormwater/leachate ponds and prevent release of stormwater/leachate into the local environment including water quality control measures; and • human safety.			
Sch 4	16	e) identify emergency evacuation routes, flood warning alarms,			

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		and evacuation procedures. This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).			
Leachate Management					
Sch 4	17	The Proponent shall:			Compliant
		a) design and install the leachate management and collection system (including new leachate pond) generally in accordance with the conceptual design in the EA/PPR, applicable Australian Standards and industry standard best practice guidelines, or otherwise approved by the EPA;	Western Gully Deep Leachate Drainage Completion Report, 17 August 2017 Section 7.0 LEMP	Construction of the Leachate Drainage System was approved by NSW EPA through Environment Protection Licence (EPL) 5862 Condition O6.13: The licensee is permitted to construct the Deep Leachate Drainage System in accordance with the following documents, drawings and requirements: a) "Henry & Hymas Detailed Design Report - Project Name: Western Gully Deep Leachate Drainage System - Whytes Gully Landfill", H&H Consulting Engineers Pty Ltd, December 2016. The leachate system was observed under construction during the site inspections, including a new leachate pond. The Western Gully Deep Leachate Drainage Completion Report, 17 August 2017 covered this aspect of the leachate management system.	
		b) ensure that leachate generated by the project is minimised and appropriately contained, collected and disposed of;		The management of leachate is detailed in the LEMP, Section 7. An incident involving a broken leachate line incident was reported to the EPA on 20 November 2017. As reported by the Waste Operations Manager, the leachate was contained and collected. The incident report was not available at the time of this audit.	
		c) collect and store all leachate generated by the project until it is transferred for treatment/processing;		Defined under LEMP Section 7. During the site inspection, leachate was observed being stored prior to treatment.	
		d) install a leachate barrier to be used for the direct impoundment of leachate (see Conditions 10 to 13 of this Schedule);		Defined under LEMP Section 7. See responses to conditions 10-13.	
		e) design and operate the leachate management system to prevent leachate from escaping to surface water, groundwater or the surrounding subsoils;		Defined in Western Gully Deep Leachate Drainage Completion Report, 17 August 2017.	
		f) ensure that the leachate management and collection system does not include leachate discharge or disposal by way of leachate re-injection into any active or capped landfill cell, unless otherwise approved by the EPA;		Defined under LEMP Section 7. As detailed above, the design has been approved by the EPA.	
		g) direct all surface water from areas not subject to waste disposal or leachate disposal away from the leachate management system; and		Defined under LEMP Section 7. Observations during the site inspection indicated that surface waters are generally away from the leachate management system, where feasible.	
		h) treat all water that has entered areas filled with waste, or		Defined under LEMP Section 7. Water that had entered the	

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		been contaminated by leachate, as leachate, to the satisfaction of the Director-General.		waste placement areas was generally managed as leachate and directed to the leachate treatment plant. WCC could not demonstrate "satisfaction of the Director General through documents. Auditors have not completed detailed assessment of the Leachate Management System and have relied on the documents listed to determine compliance with this condition.	
Soil, Water and Leachate Management Plan					
Sch 4	18	The Proponent shall prepare and implement a Soil, Water and Leachate Management Plan for the project in consultation with Council, NOW and the EPA and to the satisfaction of the Director-General. This plan must be prepared and implemented by a suitably qualified and experienced person and be approved by the Director-General prior to the commencement of operation. The plan must include:	Section 7.3 of LEMP defined the surface water and sediment controls.	Process to manage the soil, water and leachate is defined in Section 7.3 of LEMP with reference to future works as per detailed design report for ongoing Package 2 and 3 landfill cell. The LEMP was prepared by Golders and approved by DPE on 11/12/14. **Implementation:** Evidence of implementation was noted in the monitoring of groundwater, surface and leachate water. Maintenance of leachate pond and water treatment facility was also noted.	Compliant
		a) a site water balance that: • identifies the source of all water collected or stored on site, including rainfall, stormwater and groundwater; • includes details of all water use on site and any discharges; and • describes the measures that will be implemented to minimise water use on site	Section 3.2.6 of the LEMP Technical Memorandum dated March 2012: Leachate Generation and Water Balance Modelling	Details of the Site Water Balance is provided in Section 3.2.6 of the LEMP. This references to other sections of the LEMP for further details. A detailed assessment is provided in Technical Memorandum dated March 2012: Leachate Generation and Water Balance Modelling. Based on approval of the plan the condition has been assessed as compliant. Water use onsite is considered minimal and mainly comprises dust suppression and office use. Trade waste water is discharged to sewer as per the Sydney Water Trade waste agreement. The effluent is sampled / monitored prior to discharging to the sewer.	Compliant
		b) an erosion and sediment control plan that: • is consistent with the requirements in the latest version of the Blue Book Volume 1 and Volume 2B; • identifies the activities on site that could cause soil erosion and generate sediment; and • describes the measures that will be implemented to: o minimise soil erosion and the transport of sediment to downstream waters, including the location, function and capacity of any erosion and sediment control structures and maintain these structures over time; o ensure that any topsoil stockpiles on site are suitably managed to ensure that the topsoil in these stockpiles can be beneficially used in the	Section 7.2.3 of LEMP defined the surface water and sediment controls.	Erosion and sediment control is presented in Section 7.2.3 of the LEMP. Observations made during the site inspection included that: • the Sediment pond is being maintained and monitored. Exposed areas are spray grassed and covered. • no significant areas of erosion were observed in drainage lines • some areas of the bank in the vicinity of the outlet to the sediment basin were not stabilised. • near the new cell construction where drainage and creek lines had recently been affected and controls	Compliant

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		proposed revegetation and rehabilitation of the site.		had not been re-instated (this issue was already covered in the WCC Public Works Site Surveillance to be addressed by the contractor). See photos below. **OFI: Ensure ERSED controls are replaced promptly after works near drainage lines and stabilise the bank of the sediment pond near the outlet and.**  	
Sch 4	18	c) a leachate management plan that: • includes final detailed design specifications of the leachate management and collection system on site; • demonstrates how the requirements of Condition 17 of this Schedule have been addressed; and • includes a remedial action plan should leachate escape the leachate containment system.	Section 7.2.4 of LEMP defined the control and management of leachate Western Gully Deep Leachate Drainage Completion Report, 17 August 2017	Leachate collection system is in operation and maintained. 	Compliant
		d) a stormwater management plan that: • is consistent with the guidance in the latest version of	LEMP Section 7.2.3	Surface water and sediment control management is defined in Section 7.2.3 of LEMP which demonstrated compliance to	Compliant

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		the Blue Book Volume 1 and Volume 2B and Chapter E14 of Wollongong DCP 2009; • includes final detailed design specifications for the stormwater management and collection system; and • demonstrates how the requirements of Condition 15 of this Schedule has been addressed	WHYTES GULLY LANDFILL Detailed Design Report Update - Tender Package 2 and 3 Landfill Cells, 5 October 2016 Whytes Gully Stormwater Management Work Instruction July 2016	this requirement. The detailed design is included in the Detailed Design Report 2013 and 2016. .	
		e) an on-going surface water, groundwater and leachate monitoring program that includes (but is not limited to): • baseline data; • a combined surface and groundwater monitoring program to gain an understanding of surface and groundwater interaction and the potential for any impacts of the project on the downstream environment including GDEs and Dapto Creek; • surface and groundwater impact assessment criteria including trigger levels for investigating adverse impacts; • a Mitigation Plan detailing the remedial actions to be implemented address potential impacts on the downstream environment from surface or groundwater contamination associated with the project and/or in the event of exceedances of the surface and/or groundwater impact assessment criteria; and • a commitment to provide the results of monitoring to NOW and other relevant government agencies every 12 months	Section 7.3 of LEMP MONITORING LANDFILL SITES MASTER Whytes Gully analytical data Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	Section 7.3 of LEMP defined the monitoring of surface water, groundwater and leachate. Results of monitoring are recorded in a register provided to the auditors. Annual Return Report to EPA was provided as evidence. This provides a summary of water quality monitoring data and interpretation of results. The following monitoring and reporting was conducted by WCC. • Whytes Gully Groundwater Monitoring -Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring -Conducted annually in August, and after any overflow event caused by rain. WCC did not provide evidence that results of monitoring are reported to NOW and other relevant government agencies every 12 months, hence compliance with this aspect of the condition could not be verified. **Recommendation: Provide results of monitoring to NOW (or equivalent agency) and other relevant government agencies every 12 months as required of the condition.** The Plan is documented in the LEMP; Section 7.3. The auditors have relied on the approval of the plan by DPE to determine compliance with this condition and have not undertaken an assessment of the adequacy of the Soil, Water and Leachate Management Plan.	**Not Verified**
		This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).			
Contamination Management Plan					
Sch 4	19	The Proponent shall prepare and implement a Contamination Management Plan for the project to the satisfaction of the Director-General. This Plan must: a) be prepared by a suitably qualified and experienced expert;	Construction Environmental Management Plan Framework Section 3.7 Contamination Management Plan	The CEMP was prepared by Golder associates and was submitted to DPE and approved on 20/8/2013. The CEMP addresses the requirements for the Contamination Management Plan. WCC reported that many aspects of the implementation of	Compliant
Sch 4	19	b) be submitted to the Director-General prior to the commencement of construction;			

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		c) detail the protocols to be put in place and followed in the event that contaminated soil (including Acid Sulfate Soils) or water is encountered during construction; d) be prepared in accordance with the relevant best practice industry guidelines such as the NSW State Government's Acid Sulfate Soils Manual (ASSMAC 1998); e) detail how excavated soil will be tested, handled and stockpiled; f) detail the measures that will be employed to prevent erosion and sedimentation of contaminated soil; and g) outline how contaminated soil and water will be disposed of off-site (e.g. at a licensed facility). This plan must be documented in the CEMP (see Condition 2 in Schedule 5).		the Contamination management plan had not been triggered as no known contamination was uncovered or reported to date.	
Bunding					
Sch 4	20	The Proponent shall store all chemicals, fuels and oils used on-site in appropriately bunded areas in accordance with the requirements of all relevant Australian Standards, and/or EPA's Storing and Handling Liquids: Environmental Protection – Participants Handbook.	Site inspection Work Health and Safety - Site Specific OHS Procedures - Substance Register Whytes Gully CURRENT 2015	A Substance Register was provided as evidence for registering chemicals used onsite and brought to site by subcontractors. Based on a brief site inspection WCC storage and handling of chemicals were in general accordance with this requirement. The generator for the wastewater treatment plant was bunded as per the photo below.  Chemicals for the wastewater treatment plant were also stored in bunded area.	Compliant

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Erosion and Sediment Control					
Sch 4	21	During the construction of the project, the Proponent shall implement suitable erosion and sediment control measures on site, in accordance with the relevant requirements in the latest version of the Managing Urban Stormwater: Soils and Construction guideline.	Section 3.3 of CEMP defined the erosion and sedimentation controls ESCP Rev1 for Stage 2 Construction Of A New Landfill Cell At Wollongong Waste And Resource Recovery Park	A separate sediment basin/sump was constructed within the construction area and sand bags were noted along the access. Erosion and sediment control plans were developed and implemented at the site. Surveillance Reports with issues on erosion and sedimentation controls were also provided as evidence of implementation and maintenance. Issues related to erosion and sediment control are provided in response to Condition 18(b) above. The following photos are example of implementation of sediment controls at the site 	Compliant Refer to Condition 18(b).

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Soil					
Sch 4	22	The Proponent shall: a) minimise any soil loss through erosion on site; b) set aside any topsoil won on site for the proposed revegetation and rehabilitation of the site; and c) ensure that any topsoil stockpiles on site are suitably managed to ensure that the topsoil in these stockpiles can be beneficially used in the proposed revegetation and rehabilitation of the site.	Site inspection	It was noted during the site inspection that a large part of the construction area is flat and sediments are contained within the construction footprint. A sump was installed within the construction area to collect sediments and run-off is contained within construction footprint.  WCC reported that top soil was segregated and stockpile onsite for re-use. No records of the storage of topsoil were sighted.	Compliant
AIR QUALITY					
Odour					
Sch 4	23	The Proponent shall ensure the project does not cause or permit the emission of any offensive odour (as defined by the POEO Act).	Site Inspection 19. SOP - Deodouriser Trailer Operator Manual - Whytes Gully	No offensive odour was noted at the time of the first site inspection during calm, and sunny conditions. A deodoriser was observed to be in operation during the first site visit.	**Not Verified**

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However, during the second site visit, some odour was observed up slope of the tipping face on the high point of the landfill, which was downwind at the time of the inspection. The odouriser was not in operation during the second site visit. There did not appear to be a process for specific management of the face during these more adverse wind conditions.

Minutes of the Whytes Gully Reference Group meeting on 24 May 2017 indicated that one member *"mentioned the smell in the morning when the lids are lifted. It was advised that the deodoriser trailer is turned on prior to site start up to minimise odour generated. Another member mentioned that sometimes the smell is as late as 10:00am."*

No mention of odour was made in the Minutes of the Whytes Gully Reference Group meeting on 22 November 2017.

Selected incident reports were provided by WCC for odour complaints on 24 November 2016 (1 complaint); 6 March 2017 (4 complaints); and 17 March 2017 (4 complaints). The reports showed that complaints are followed up with weather data and other factors documented.

The EPA issued a letter to WCC dated 30 March 2017 responding to a letter from WCC dated 21 March 2017 in relation to odour complaints made in March 2017. The EPA noted that the identified the cause of the complaints relates to a premises not under the control of WCC.

Given the audit site inspections were of limited duration, it was not possible to fully assess compliance with this condition and is considered Not Verified.

Recommendation: WCC to ensure that odouriser is in operation as required to minimise the risk of offensive odour going off site. It is recommended that WCC review the implementation of the procedure regarding the use and placement of the odouriser.

Recommendation: It is recommended that WCC conduct additional odour monitoring to re-assess the potential for odours during southerly winds and assess if existing controls are adequate to prevent off site odours. Based on the outcomes of the monitoring, additional controls may be warranted.

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Dust Criteria					
Sch 4	24	The Proponent shall ensure that dust generated by the project does not exceed the criteria listed in Tables 2 to 4 at any private residential receiver, or on more than 25 percent of any privately owned land surrounding the site.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data	Dust monitoring results were presented in a register. Data for the old and new dust monitoring locations were included in the register. Monthly monitoring was conducted and results as reported by WCC were within the required criteria.	Compliant
Dust Minimisation					
Sch 4	25	During construction, the Proponent shall ensure that:	Site Inspection	Water cart was in operation to control dust. 	Compliant
		a) all vehicles on site do not exceed a speed limit of 25 kilometres per hour;	Site inspection	Speed limit at site was imposed, and speed limit signs were observed to be posted around the site.	Compliant
		b) all loaded vehicles entering or leaving the site have their loads covered; and	Site inspection	During the site inspection it was observed that loaded vehicles entering or leaving site have their loads covered. Covers were only open at the weighbridge for spot check on content of the vehicle.	Compliant

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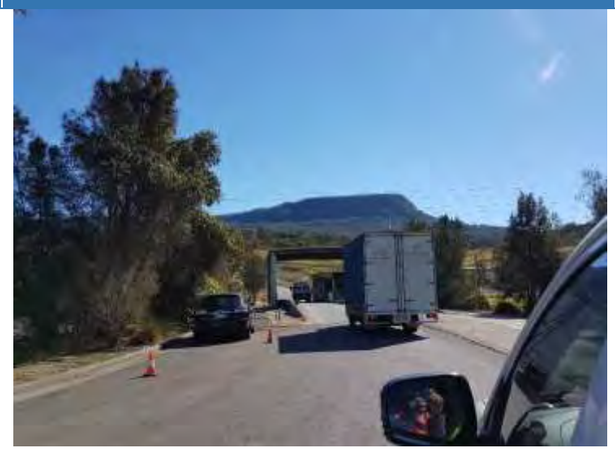
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
					
		c) all loaded vehicles leaving the site are cleaned of dirt, sand and other materials before they leave the site, to avoid tracking these materials on public roads.	Site Inspection Daily Inspection Tip face	No tracking of dirt or dust was noted on the road during the site inspection. A daily inspection of roads is also conducted by WCC. The inspection form included dust monitoring and control. No complaints had been received regarding dust tracking.	Compliant
Operating Conditions					
Sch 4	26	The Proponent shall:	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data SOP Placement & Compaction of waste SOP - Deodouriser Trailer Operator Manual - Whytes Gully Daily inspection Tip Face completed forms Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017		Compliant
		a) implement best management practice, including all reasonable and feasible dust and odour mitigation measures to prevent and minimise dust and odour emissions from operation;		WCC have developed a number of SOPs aimed at reducing dust and odour emissions. General implementation of these was evident during site inspections. There was no visible dust observed during the site inspections and a water cart was onsite for dust suppression. There is a long bitumen road on site which reduces the amount of mud and dirt picked up by trucks entering the site and trucks would likely lose dirt from wheels prior to leaving the site. At the time of the first site inspection the nature of the filling process led to a small area available for tipping, hence the design of the landfill led to a reduced tipping area. For the second site visit, the tipping area was slightly larger. WCC reported that the size of the tipping face is managed to be minimal for the reduction of odours and litter. An Odouriser was also installed and in operation to minimise odour for the first site visit. There was no offensive odour noted during the first site inspection. However, during the second site visit the odouriser was not in used and with strong southerly winds some odour was noted on higher areas of the landfill downwind of the tip face. Refer to Sch 4 (23).	**OFI-Refer to Sch 4 (23)**
		b) prevent and minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary		It was evident that WCC focus on having a very small tip face open which reduces the potential for odour generation. On	

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		events;		the second site inspection, southerly winds were evident leading to a higher risk of off site odours. There did not appear to be a process for specific management of the face during these more adverse wind conditions. **Refer to discussion and OFIs for Condition 23.**	
		c) regularly assess air quality monitoring data and relocate, modify, and/or stop operation to ensure compliance with the relevant conditions of this consent; and		There are 3 old dust gauges (C328-1, C328-2 and C328-3) and 5 new dust gauges (DDG1 to DDG5) installed around the site. Monitoring results are posted in WCC website The dust monitoring data were analysed and graphed. The data is reported in the MONITORING LANDFILL SITES MASTER Whytes Gully analytical data. No reported exceedance of the criteria was observed in this data as presented. It was noted there was no observed increase of dust deposited during construction based on the data provided.	
Sch 4	26	d) minimise surface disturbance of the site, other than as permitted under this consent		Disturbed areas were generally observed to be areas required for landfilling or the construction of new areas of the landfill. Exposed ground and stockpiles are spray grassed to stabilise surfaces.	
Project Areas					
Sch 4	27	For each stage of the project identified in Table 5, the Proponent shall comply with the maximum area specified for active tipping face, waste relocation, daily cover and 90 day cover in the corresponding row and columns (from left to right), unless otherwise approved by the Director-General in consultation with the EPA.	Section 3.0 of LEMP EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017	Section 3.0 of LEMP defined the future operations and key site features that covers this requirement. WCC provided an example of - Daily inspection Tip Face and waste data tonnage, SOP for placement and compaction of waste and volumetric survey (EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017). **Implementation:** At the time of the site inspection there was no relocation of wastes, hence the areas defined in Table 5 for this purpose were being complied with. Based on the site inspection, it was not able to be determined what the exact area of the active tipping face was and whether this was within the limits of Table 5. WCC were not able to provide figures demonstrating the exact size of the tip face; daily cover and 90 day cover areas so as to demonstrate compliance with the condition. Based on the apparent and relatively small size of the tipping face, WCC were deemed compliant with this condition for the tipping face. The areas of the daily cover and 90 day cover were not provided by WCC and compliance with this aspect of the condition was not able to be verified. **OFI: It is recommended that WCC conduct a review of implementation of the LEMP and SOPs in respect to tipping areas to demonstrate compliance with the figures in Table 5 for the areas of tipping face; daily cover; and 90 day cover.**	Compliant **OFI**

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Monitoring					
Sch 4	28	The Proponent shall install and operate a meteorological weather monitoring station on the site for the life of the project that complies with the requirements in the latest version of the EPA's Approved Methods for Sampling of Air Pollutants in New South Wales guideline. The meteorological station must be maintained so as to be capable of continuously monitoring the following parameters: air temperature, wind direction, windspeed, rainfall and relative humidity.	Section 2.3.3 of LEMP defined the Climate Data collection.	A Davis Vantage Pro 2 meteorological station has been installed at the site that will measure air temperature, wind direction, wind speed, rainfall and relative humidity. Data is being recorded and meets the requirements of the condition. 	Compliant
Air Quality Management Plan					
Sch 4	29	The Proponent shall prepare and implement an Air Quality Management Plan for landfilling operations in consultation with the EPA. The plan must:	Section 8 of LEMP defined the Air Quality Management for landfill gas and Section 9.6 for odour MONITORING LANDFILL SITES MASTER Whytes Gully analytical data		Compliant
		a) be prepared and implemented by a suitably qualified and experienced expert;		The AQMP is included in LEMP which was prepared by Golders.	
		b) be approved by the Director-General prior to the commencement of operation;		The AQMP was approved with the LEMP by DPE on 11/12/14.	
		c) describe the measures that will be implemented to ensure: • best management practice is employed; • the air quality impacts (including odour) from landfilling are minimised during adverse meteorological conditions and extraordinary events; and • compliance with the relevant conditions of this approval.		WCC adopts a strategy for day to day management of landfill via a combination of the leachate barrier system and covering of wastes, use of odouriser and dust suppression. Management of odours has been discussed under Condition 23 and 26. See relevant findings and OFI for these conditions.	
		d) describes the air quality management system; and		There is no specific conditions relating to landfill gas containment in the license. The Landfill Guidelines recommend that landfill gas should be contained by a combination of leachate barrier system, site capping and	

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				revegetation and covering of waste. The photo shown below is one of gas manifolds or gas well.  Flaring was also observed during the site inspection. Section 8.3 of LEMP defined the gas monitoring requirements. The following management techniques are applied: - subsurface gas monitoring wells - subsurface gas monitoring program - surface gas emission monitoring and - gas accumulation monitoring. Results of monitoring are presented in register included in Monitoring Landfill Sites Master Whytes Gully analytical data.	
		e) includes an air quality monitoring program that: • is capable of evaluating the performance of the landfill; • includes a protocol for determining any exceedances of the relevant conditions of approval and responding to complaints; • adequately supports the air quality management system; and • evaluates and reports on the effectiveness of the air quality management system.		The air quality monitoring as defined in LEMP Section 8 AQMP, included the following: - Odour observation - Landfill gas monitoring - Dust observation Based on the site inspection on 27 November 2017, the auditor recommends that WCC evaluate and report the effectiveness of the air quality management system specifically odour. **See the OFIs under Condition 23 and 26.**	
Sch 4	29	This plan must be documented in the Landfill EMP (see Condition 3 in Schedule 5).		The Plan is documented in Section 8.0 of LEMP.	
Greenhouse Gas Management Plan					
Sch 4	30	The Proponent must develop and implement a Greenhouse Gas Management Plan prior to the commencement of operation of the new	Section 8.5 of LEMP defined the Greenhouse Gas Management Plan	The following greenhouse gas reduction measures are defined in the LEMP to be implemented by WCC.	Compliant

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		landfill cells. This plan must include, as a minimum:	Whytes Gully Landfill Methane Gas Monitoring data - accumulation Whytes Gully Landfill Methane Gas Monitoring – Wells Gas analysis records in April 2017.		**Non-compliant**
		a) final details of the landfill gas management system including flaring and/or combustion to reduce potential greenhouse gas emissions from the landfill;		Flaring was being conducted and was observed during site inspections.	
		b) energy saving measures to be implemented; and		Based on the records and audit inspection the following were noted: - Plant and equipment were maintained to reduce emissions - Flaring was conducted of methane capture in some areas of the landfill.	
		c) include a program to monitor the effectiveness of these measures, and a protocol to periodically review the plan.		WCC reported that greenhouse gas emissions are monitored continuously and reported via a contract provider monthly to assess the effectiveness and efficiency of the landfill gas management system. The effectiveness of the system is reported quarterly to Council as part of Council's annual plan. Internal annual sustainability reporting is also conducted which includes an annual review of greenhouse gas emissions at the landfill and assesses opportunities to implement further energy and greenhouse gas emissions improvements. An example action from the energy use review has resulted in the installation of solar photovoltaic energy at the Whytes Gully site. The solar photovoltaic system is now operational. This system was not sighted by Auditors. WCCs Annual Report includes the following text on page 20: *"Greenhouse gas emissions reduction projects: This program is helping to reduce Council's greenhouse gas emissions by establishing and delivering an array of projects that provide carbon abatement. Various projects that have the potential to reduce Council's carbon footprint were progressed during the year. The largest project under way was the Whytes Gully landfill gas capture and flaring project which successfully stopped approximately 660 tonnes of methane gas from being released into the atmosphere. Other carbon abatement projects including solar photovoltaic cell installations and high efficiency lighting upgrades were also completed."* No review of the plan has been conducted since the LEMP was developed in 2014. WCC did not demonstrate how they have assessed the effectiveness of energy saving measures. Based on the information provided, WCC are not compliant with part c of the Condition. **Recommendation: WCC to review the LEMP and sub-plans to: assess the extent of implementation; assess the effectiveness of the landfill gas management system and energy saving measures; and update the plan to address current site practices.**	
		This plan must be documented in the Landfill EMP (see Condition 3 in		Documented in LEMP Section 8.5.	

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		Schedule 5).			
NOISE					
Noise Limits					
Sch 4	31	The Proponent shall ensure that the noise generated by the operations on site does not exceed the criteria in Table 6 at any private residential receiver.	Appendix M of the LEMP – Noise Management Plan Whytes Gully New Landfill Construction – Select Civil Noise Monitoring Report dated 25 November 2013 Whytes Gully New Landfill Construction – Select Civil Noise Monitoring Report dated 02/07/2014	Appendix M of the LEMP – Noise Management Plan defines noise mitigation and monitoring required. The Plan does not require noise monitoring to be conducted specifically for operations, however does require Contractors to conduct noise monitoring during construction activities. Noise monitoring assessments were conducted during construction, and noise monitoring reports for construction were provided. The reports indicated that noise criteria were not exceeded for periods of construction. During these periods operations were ongoing, hence it is considered the monitoring is likely to be useful in verifying compliance to this condition.	Compliant
Operating Conditions					
Sch 4	32	The Proponent shall: a) implement best management practice, including all reasonable and feasible noise management and mitigation measures to prevent and minimise operational, low frequency and traffic noise generated by the project;	LEMP Section 9.7 Noise Control and Appendix M Site inspection	Based on the complaint register there was no record of noise complaints. WCC operations work within standard operating hours and maintenance of plant and equipment is undertaken. The Whytes Gully Reference Group Meeting minutes dated 22 November indicated a community representative mentioned *"the pitch of the compactor and loaders reversing signals"*. WCC indicated this was to be investigated. **OFI: Ensure all plant use low frequency reversing alarms.**	Compliant **OFI**
Sch 4	32	b) minimise the noise impacts of the project during adverse meteorological conditions when noise criteria do not apply;	East Cape Contractor Service Maintenance Records and noise monitoring ERTECH Premobilisation Checklist	Construction works only during standard hours. Noise monitoring assessments were conducted during construction contractors. Noise monitoring reports for construction were provided as evidence. It was noted that noise criteria were not exceeded.	Compliant
		c) maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired; and		Plant and equipment inspection records were provided as evidence. No works outside standard hours.	Compliant
		d) regularly assess noise monitoring data and relocate, modify and/or stop operations to ensure compliance with the relevant conditions of this approval.		Noise monitoring has been conducted and selected results provided. No noise complaints have been received during construction. Plant and equipment were inspected and maintained. High noise levels were not observed during site inspections.	Compliant
Operating Hours					
Sch 4	33	The Proponent shall comply with the construction and operating hours detailed in Table 7 for the site, unless otherwise agreed in writing by	August 2017 Weighbridge hours 18 September	Landfill operations as per the data provided (use of the	Operations –

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		the Director-General.	2017	weighbridge) were within the standard hours between 7:30 and 4:30. WCC confirmed that no works were conducted outside of standard working hours.	Compliant Compliant
Noise Management Plan					
Sch 4	34	The Proponent shall prepare and implement a Noise Management Plan for the project in consultation with the EPA and to the satisfaction of the Director-General. The plan must:	Section 3.4 of CEMPF Section 9.7 LEMP and Appendix M Noise Management Plan		Compliant
		a) be prepared and implemented by a suitably qualified and experienced person whose appointment has been approved by the Director-General;		The plan was prepared by Golders.	
		b) be approved by the Director-General prior to the commencement of construction;		The plan was approved by DPE as part of the LEMP on 11/12/14.	
		c) describe the measures that will be implemented to minimise noise from the construction and operation of the project and ensure: • best management practice is employed on site; • implementation of traffic noise management measures; • the noise impacts of the project are minimised during adverse meteorological conditions; and • compliance with the relevant conditions (including noise limits) of this approval.		Measures are described in the plan. Refer to discussion for Condition 32.	
		d) describe the noise management system;		Described in the plan	
		e) includes a noise monitoring program that: • is capable of evaluating the performance of the project; • includes a protocol for determining exceedances of the noise limits in this approval and responding to complaints; • adequately supports the noise management system; and • evaluates and reports on the effectiveness of the noise management system	East Cape Contractor Service Maintenance Records and noise monitoring ERTECH Premobilisation Checklist	Noise monitoring for construction activities were conducted and records of monitoring report were provided to auditor, however, the implementation of the Noise Management Plan (specifically for operations) was not reviewed during this audit. WCC did not provide evidence of "*evaluating and reporting on the effectiveness of the noise management system"* as required of the condition. **OFI: It is recommended that WCC conducts a review of the implementation of the noise management plan for operations and construction to ensure compliance to this condition.** **OFI: WCC to address the requirement of the condition to *"evaluate and report on the effectiveness of the noise management system".***	**OFI** **OFI**
Sch 4	34	f) include a description of the remedial actions that may be implemented in the event of a noncompliance with the noise limits in this approval.	Section 9.7 of LEMP	No non-compliance with the noise limits were identified. No complaints were recorded as having been received regarding	

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			Section 3.4 of CEMPF	noise.	
		This plan must be documented in the CEMP and Landfill EMP (see Conditions 2 and 3 in Schedule 5).		Documented in CEMP and LEMP.	
TRANSPORT					
Traffic Monitoring					
Sch 4	35	The Proponent shall:			
		a) keep accurate records of the volume of waste transported to the site	August 2017 Weighbridge hours 18 September 2017 Ertech Stage 2 and 3 Traffic Management Plan	Volume of waste transported to the site are measured on the Weighbridge and documented in spreadsheets sighted. Traffic Management Plan included the haulage route for construction heavy vehicles for deliveries.	Compliant
		b) nominate a haulage route to be used by heavy vehicles accessing the landfill consistent with the traffic assessment in the EA; and			
		c) make these records available in its Annual Report.			
Operating Conditions					
Sch 4	36	The Proponent shall ensure that			
		a) internal roads, driveways and parking (including grades, turn paths, sight distance requirements, aisle widths, aisle lengths and parking bay dimensions) associated with the project are constructed and maintained in accordance with the latest versions of AS 2890.1 and AS 2890.2;	August 2017 Weighbridge hours 18 September 2017 Site inspection	This audit did not assess compliance with the Australian Standards referenced, hence construction of the roads etc. to these standards was not assessed as Auditors are not traffic experts. The swept path of the longest vehicle entering the site was not assessed during the audit. No queuing of vehicles noted during the site audit, however it was indicated that some waste trucks are likely to queue on the road outside the facility before 7:30 am waiting for the site and weighbridge to be opened. Due to the extra lane on the road adjacent to the entrance to the facility, trucks are able to queue and not obstruct local traffic. During operating hours, there is room for vehicles to queue on site prior to having to stop. Consultation with RMS did not identify any traffic related issues relating to WCC Operations. Auditors did not observe trucks queuing on public roads, and hence were unable to verify from observation the extent and nature of queuing on public roads. Hence auditors were not able to verify if WCC are not compliant with sub conditions c, d and e. Loading and unloading is carried out on site, and traffic management noted to be in good control during site audit, hence compliance was verified with sub-conditions f and g. **Recommendation: That WCC confirm with RMS that current arrangements related to trucks parking outside the facility prior to opening is acceptable, and notify DPE**	Condition 36a and b Not Assessed Conditions 36 c to e **Not Verified** Conditions 36 f and g Compliant
		b) the swept path of the longest vehicle entering and exiting the subject site, as well as manoeuvrability through the site, is in accordance with AUSTROADS;			
		c) the project does not result in any vehicles queuing on the public road network;			
		d) heavy vehicles and bins associated with the project do not park or stand on local roads or footpaths in the vicinity of the site;			
		e) all vehicles are wholly contained on site before being required to stop;			
		f) all loading and unloading of materials is carried out on site; and			

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				of the outcomes of this consultation.	
		g) the proposed turning areas in the car park are kept clear of any obstacles, including parked cars, at all times.		No issues with obstacles in the car park were observed.	
Intersection Upgrade					
Sch 4	37	Prior to the receipt of more than 180,000 tpa of waste at the Whytes Gully RRP in any calendar year, or as otherwise directed by RMS, the Proponent must upgrade the intersection of West Dapto Road and the Princes Highway to traffic signals in accordance with WCC's Works Authorisation Deed with RMS, to the satisfaction of RMS.	Princes Highway Reddalls Road Intersection Upgrade design	Princess Highway Reddalls Road Intersection was upgraded as part of the landfill new cell project.	Compliant
Construction Traffic Management					
Scg 4	38	The Proponent shall prepare and implement a Construction Traffic Management Plan for the project, to the satisfaction of the Director-General. The Plan shall:	Ertech Stage 2 and 3 Traffic Management Plan CEMPF Section 3.5 Public Road and Impacts	Traffic Management Plan for Ertech was prepared and provided as evidence. Details required in this condition were included in the TMP. Auditors are not traffic experts hence did not conduct a full assessment of this condition.	Compliant
Sch 4	38	a) be prepared in consultation with Council and RMS by a suitably qualified and experienced expert;			
		b) be approved by the Director-General prior to the commencement of construction;			
		c) include a detailed analysis of the impact of the project on the road network during construction;			
		d) detail the measures that would be implemented to manage internal and external road safety and network efficiency including measures to control traffic movements during construction;			
		e) detail the access and parking arrangements for the site during construction;			
		f) detail the measures to ensure that the local road network is not utilised by vehicles associated with the project during construction; and			
		g) if necessary, detail procedures for notifying residents of any potential disruptions to routes and access.			
		This plan must be documented in the CEMP (see Condition 2 in Schedule 5).			
VISUAL AMENITY					
Lighting					
Sch 4	39	The Proponent shall ensure that the lighting associated with the project:		Lighting or visual amenity management was not included in CEMPF and LEMP. WCC reported that no works (operations or construction) are conducted at night. No lights are kept on at night except for security lights at the weighbridge. Therefore WCC are deemed compliant with this condition as it is largely not relevant.	Compliant
		a) complies with the latest version of AS 4282(INT) - Control of Obtrusive Effects of Outdoor Lighting; and			
		b) is mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.			
Landscaping					

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Sch 4	40	The Proponent shall progressively implement the Landscape Plan (Appendix 7) following the completion of ground disturbing works across the site, to the satisfaction of the Director-General.	The Landscape Plan	The Landscape Plan (Appendix 7) defines landscaping over areas not yet landfilled and hence are not able to be rehabilitated, hence this condition is not triggered.	Not Triggered
Signage					
Sch 4	41	The Proponent shall not install any advertising signs on site without the written approval of the Director-General.	Site Inspection	No advertising was installed around the site perimeter during site audit.	Compliant
HAZARDS					
Pre-construction					
Sch 4	42	The Proponent shall prepare the studies set out under subsections 42(a) to 42(b) (the pre-construction studies). Construction, other than of preliminary works that are outside the scope of the hazard studies, shall not commence until study recommendations have been considered and, where appropriate, acted upon. a) <u>Bushfire Risk Management Strategy</u> A Fire Management Strategy for the Project. This strategy shall cover all proposed recommendations and safeguards set out in the Bushfire Report at Appendix M of the EA.	LEMP Section 8.2.3	The LEMP (Section 8.2.3) includes an approach to address bushfires. WCC reported that this addresses Condition 42a. Implementation of the Fire Management Strategy as set out in the LEMP was not reviewed during this audit. Auditors are not specialists in bushfire management.	Complaint
Sch 4	42	b) <u>Hazard and Operability Study</u> A Hazard and Operability Study (or equivalent) for the proposed landfill gas handling equipment, chaired by an independent qualified person. The study shall be consistent with the Department of Planning's Hazardous Industry Planning Advisory Paper No. 8, 'HAZOP Guidelines'.	HAZOP Study	A Hazard and Operability Study (HAZOP) was sighted for the Flare that included gas lines, manifolds, pipelines, condensate return lines, compressed air lines and the existing gas header. WCC stated that the HAZOP independence was ensured by the facilitator being independent from RUN Energy who designed the system. Auditors did not assess the HAZOP to the extent to verify if it was completed in accordance Department of Planning's Hazardous Industry Planning Advisory Paper No. 8, 'HAZOP Guidelines'.	Compliant
Pre-commissioning					
Safety Management System					
Sch 4	43	Prior to commissioning, the Proponent shall develop and implement a comprehensive Safety Management System (SMS), covering all on-site operations. The Safety Management System shall be consistent with the Department of Planning's Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'. The SMS shall include procedures for ensuring the ongoing implementation and integrity of	Safety Management Plan SMP dated 2 June 2016 Safety Management Plan SMP Induction TEMPLATE Checklist CURRENT June 2016 Work Health and Safety - Site Specific OHS Procedures - Substance Register Whytes Gully	WCC reported that the Safety Management Plan dated 22 June 2016 addresses the condition to develop an SMS. This audit did not include an assessment of the implementation of the SMS as this was considered beyond	Compliant

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		the safeguards identified in the Preliminary Hazard Analysis (PHA) at Appendix L of the EA and in the Bushfire Risk Management Strategy at Appendix M of the EA.	CURRENT 2015 Example of Minutes Site Safety - Whytes Gully - December 2015 Ertech WORKPLACE HEALTH, SAFETY & ENVIRONMENT MANAGEMENT PLAN	the scope of the IEA. The auditors were not commissioned to assess safety issues or safety compliance.	
	Pre-startup				
	Pre-startup Compliance Report				
Sch 4	44	The Proponent shall submit to the Department a report detailing compliance with Conditions 42 and 43 one month prior to the commencement of operation.		Evidence of reporting requirements as per this condition was not sighted or provided to the auditors. **Recommendation: That WCC submit to the Department a report detailing compliance with Conditions 42 and 43; or alternatively discuss the requirement with DPE and determine another approach to meet DPE's requirements.**	Not Compliant
	Pest, Vermin & Noxious Weed Management				
Sch 4	45	The Proponent shall: a) implement suitable measures to manage pests, vermin and declared noxious weeds on site; and b) inspect the site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in surrounding area. *Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Noxious Weed Act 1993.*	Whytes Gully New Landfill Cell Vegetation Management Plan Review Project no. 25059 Updated Vegetation Management Plan by Biosis July 2017 Feral Animal Control - Whytes Gully Weed Control Schedule Various emails regarding organising weed control personnel in 2016 and 2017.	During the site inspections, numerous weeds including noxious weeds were evident across the site. Current weed controls appeared limited and was not able to be explained in detail by WCC. Based on site observations, weed controls measures across the site were not adequate or effective. WCC reported that the site is inspected monthly and control undertaken periodically derived from inspection results. Implementation records provided included: 1) a schedule of weed management visits for all of council's sites. This indicated site visits on 7 occasions were scheduled over 2017; 2) emails discussing various weed areas and requesting weed control services during 2016 and 2017; WCC did not demonstrate that a systematic and through approach is taken to management and control of weeds at the site. Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013). A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outlined in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12-month period, with consideration to the current condition	**Non-compliant**

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				of the site and the ongoing viability of the site during and after the VMP works. WCC provided a screen shot of records for Wild Dear Operation - Feral Animal Control - Whytes Gully with latest record dated 24, 25, 26 October 2017. Given the extent of weeds across the site, WCC are considered not compliant with this condition. Implementation of the control measures defined by Biosis will go towards addressing compliance issues with this condition. **Recommendation: Implement the controls in the program as defined by Biosis for pest, vermin and noxious weeds management.**	
	Fire Management				
Sch 4	46	The Proponent shall: a) implement suitable measures to minimise the risk of fire on site, including in the landfill area; b) extinguish any fires on site promptly; and c) maintain adequate fire-fighting capacity on site.	LEMP Section 9.9 Firefighting Capacity Emergency Evacuation Wollongong Waste and Resource Recovery Park 25 January 2017 Whytes Gully see Z17/25130	WCC had conducted an emergency evacuation drill on January 2017. The LEMP defined the firefighting management strategy and capacity. WCC indicated that no fire had been reported since 2013. The Auditors are not Fire experts and have not assessed WCC's ability to manage fires at the site or compliance with this condition. **OFI: WCC conduct a review of their capability to manage fire risk and maintain adequate fire-fighting capacity on site.**	Not Assessed
	CONSERVATION				
	Heritage				
Sch 4	47	During the life of the Project, the Proponent shall protect the identified heritage and archaeological sites outside of the Project footprint, in consultation with the Local Aboriginal Land Council, and to the satisfaction of the Director-General. *Note: The location of heritage and archaeological sites on the site are illustrated in Appendix 8 of this approval*.	LEMP figure 8 Heritage LEMP Section 2.4 Cultural Heritage	LEMP Figure 8 demonstrated the heritage and archaeological sites are outside the project footprint. LEMP Section 2.4 defined the management requirement for Cultural Heritage. Reported finds as part the initial EIS and covered under the COA which are located outside the project footprint. WCC reported that there has been no impact to these sites. Auditors did not visit these sites and have relied on WCC information in respect of determining compliance with this condition.	Compliant
	Heritage Management				
Sch 4	48	The Proponent must prepare: a) heritage training and induction processes for construction personnel (including procedures for keeping records of inductions) including site identification, protection and	ERTECH Induction attended by auditors.	Auditors attended an Induction by construction personnel that included heritage.	Compliant

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		conservation of Aboriginal and historic heritage; and			
		b) procedures for dealing with heritage items including human remains, including cessation of works in the vicinity and notification of the Department, NSW Police Force (in the case of human remains), OEH and registered Aboriginal stakeholders and not recommencing any works in the area unless authorised by the NSW Police Force and/ or the Department.	CEMPF Section 3.10 Archaeological and Heritage Protection Plan	Procedure is defined in the CEMP and LEMP. Implementation not yet triggered as WCC reported that there has been no finds to date. The Heritage items noted in the EA were outside the construction boundary.	Compliant
		These procedures must be documented in the CEMP (see Condition 2 in Schedule 5).	CEMPF Section 3.10 Archaeological and Heritage Protection Plan	Documented in CEMPF Section 3.10 Archaeological and Heritage Protection Plan.	
Vegetation and Biodiversity Management					
Sch 4	49	The Proponent shall prepare and implement a Vegetation Management Plan for the project to the satisfaction of the Director-General. This plan must:	CEMP Appendix C Vegetation Management Plan 2013 Updated Vegetation Management Plan July 2017 LEMP Section 11 Vegetation and Biodiversity Management Appendix O of the LEMP		Preparation: Compliant
		a) be prepared by a suitably qualified and experienced expert;		Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013).	**Implementation: Non-compliant**
		b) be approved by the Director-General prior to the commencement of construction;		The initial Vegetation Management Plan was included in the LEMP which was approved by DPE on 11/12/14.	
		c) include a vegetation clearing protocol (see Condition 50 of this Schedule);		The plan included a vegetation clearing protocol.	
		d) must specifically include a Biodiversity Offset Strategy that: • is assessed against the OEH's 'Principles for the Use of Biodiversity Offsets in NSW' and the 'Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, SSD and SSI Projects'; • details the proposed offset measures to be implemented and secured for removing 0.49 hectares of native vegetation (including 0.01 hectares of Illawarra Subtropical Rainforest); • identify conservation mechanisms to be used to ensure the long term protection and management of the offset sites; • references best practice management guidelines for restoring and managing the vegetation communities proposed for protection; • details how the proposed offset measures will be protected, managed, funded and monitored over the life of the project;		Section 4.2 of the Biosis Vegetation Management Plan includes an assessment against the OEH principles. It is assumed that the approach to offsets was adequate as the plan was part of the LEMP approved by DPE. Auditors have not conducted an assessment of the plan against the Principles. In addition, the Vegetation Management Plan describes the following: The recommended management actions have been adjusted according to Councils requirement for each Management Zone to meet the condition targets to date outlined in the VMP (Biosis 2013). Specifically, the management actions outlined in this report align with a more intensive weed control program to achieve the condition targets within a 12 month period. (See discussion and OFI for Condition 45). Regeneration works are to be prioritised in the areas of vegetation in best condition; Management Zones 2 and 3 specifically, as these zones contain highest condition native vegetation remnants, including Illawarra Subtropical Rainforest EEC in Management Zone 2 and Illawarra Lowlands Grassy Woodland in Management Zone 3. Revegetation of Management Zones 5a and 5b should be undertaken using the plants provided in the recommended species lists provided in the VMP (Appendix 1, Biosis 2013). The management actions for each Management Zone are	

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				outlined in Table 3 of the document. Refer to Appendix 3 for the proposed timeline for the recommended scope of works to achieve the performance criteria outlined in Table 3 of the VMP 2017. This audit did not include a detailed assessment of the implementation of the Biodiversity Offset Strategy. Based on the issues related to weeds identified above in Condition 45; and outcomes of the Biosis report where more stringent weed actions are defined to be required, WCC are considered to be Non Compliant with the implementation of the weed controls measures identified in the Vegetation Management Plan. **Recommendation: It is recommended WCC implement weed controls as defined in the Vegetation Management Plan.** **Recommendation: That WCC complete the implementation of the Vegetation Management Plan in full (in addition to weed management as defined above) and in regard to Offsets as detailed in the Vegetation Management Plan.** **Recommendation: Report progress in implementation of the VMP in Annual Environmental Reports.**	
		e) ensure the project maintains suitable buffer distances to nearby waterways in accordance with Wollongong DCP 2009 to protect riparian land; and		The project maintains suitable buffer distance to nearby waterways.	
		f) details the site-wide ecological management and monitoring program/s to be implemented for the life of the project.		In 2017, WCC required an updated assessment of the current condition of the vegetation within the study area and the maintenance required to meet the performance criteria to date as outlined in the VMP (Biosis 2013). Performance criteria 'to date' was based on the assumption that the proposed works program would currently be in year four, if the VMP had been implemented in 2014. A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outline in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12 month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works.	
		This plan must be documented in the Landfill EMP and CEMP (see Conditions 2 and 3 in Schedule 5).		Documented in CEMPF Appendix C Vegetation Management Plan 2013; LEMP Section 11 Vegetation and Biodiversity Management and Appendix M of the LEMP.	
Sch 4	50	The Vegetation Clearing Protocol must:			

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SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		a) clearly identify the location and type of vegetation to be retained and to be removed from the site;	CEMP Appendix C Vegetation Management Plan 2013 Updated Vegetation Management Plan July 2017 Completion of pre-clearance surveys and habitat removal supervision at Whytes Gully Resource Recovery Park, Kembla Grange 2 March 2017	A Vegetation Clearing Protocol was provided in the DPE approved 2013 Vegetation Management Plan. Pre-clearance surveys and habitat removal supervision report by Biosis was provided as evidence of implementation.	Compliant
		b) detail measures that would be implemented for vegetation clearing			
		c) ensure vegetation, including trees would not be pushed or felled into any retained bushland areas during the vegetation removal process;			
		d) detail procedures to manage impacts on fauna including translocation of fauna by a suitably qualified ecologist/wildlife rescuer (if appropriate); and			
		e) detail the staging of construction to avoid breeding.			
LANDFILL CLOSURE AND REHABILITATION					
Sch 4	51	The Proponent shall prepare and implement a Rehabilitation Management Plan for the landfill to the satisfaction of the Director-General. This plan must:	Section 10 of LEMP Site Closure Section 10.2 Site capping and revegetation	Rehabilitation Management Plan was defined in Section 10.2 of LEMP as Site Capping and Revegetation. The implementation is not yet triggered as landfilling is ongoing with no areas available to rehabilitate. No rehabilitation works have been conducted to date,	Compliant
		a) be prepared in consultation with the OEH by a suitably qualified and experienced expert;			
		b) be submitted to the Director-General for approval within six (6) months of the date of this approval;			
		c) be undertaken in a manner which is complementary with the rehabilitation is consistent with the proposed final landform depicted in the figures in Appendices 4 and 7;			
		d) specify a time period for the rehabilitation to works to commence and be finalised following cessation of landfill activities; and			
		e) be documented in the Landfill EMP (see Condition 3 in Schedule 5).			
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT, REPORTING & AUDITING					
COMMUNITY EDUCATION PROGRAM					
Sch 5	1	The Proponent shall prepare and implement a Community Education Program for the project to the satisfaction of the Director-General. This program must be submitted to the Director-General for approval prior to the commencement of operation, and shall at a minimum focus on promoting resource recovery activities provided at the site.	Appendix P of LEMP	Community Education Program was prepared as part of the LEMP and is assumed to have been approved as part of the LEMP approval. Implementation was demonstrated by providing brochures to the community and recycling transfer area for small vehicle and community recycling area was built.	Compliant
ENVIRONMENTAL MANAGEMENT					
Construction Environmental Management Plan					
Sch 5	2	The Proponent shall prepare and implement a Construction Environmental Management Plan for the project to the satisfaction of the Director-General. The Plan must	Construction Environmental Management Plan Framework (CEMPF) August 2013	The CEMPF was prepared by Golder Associates in August 2013 and was submitted to DPE for approval on 20 August 2013. The CEMPF satisfy these requirements of the conditions of approval.	Compliant
		a) be approved by the Director-General prior to the commencement of construction;	DPE Approval letter dated 20 August 2013		

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SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		b) identify the statutory consents and approvals that apply to the project;	CEMPF Section 2.1	**OFI: The Construction Environmental Management Plan has not been updated since 2013. It is suggested that WCC review and update the plan to ensure its alignment with changes on site; and relevant EPL variations.** The ERTECH CEMP was provided as evidence of compliance for construction activities. WCC reported that they conduct a review of the Contractor's CEMP against the requirements of the CEMPF. The Auditors did not assess the ERTECH CEMP for compliance against the CEMPF or sight this review. A Pre-Start Review of the adequacy of Environmental Management Plans – Checklist for ERTECH was conducted on 14/03/17 prior to commencing construction work.	**OFI**
		c) include a copy of all relevant management plans and monitoring programs required under this approval;	CEMPF Section 2.2 and 2.3		
		d) outline all environmental management practices and procedures to be followed during construction and demolition works associated with the project;	CEMPF Section 3.0 and Appendices		
		e) describe all activities to be undertaken on the site during construction of the project, including a clear indication of construction stages	CEMPF Section 3.0 and Appendices CEMPF Section 4 CQAP		
		f) detail how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts	CEMPF Section 3		
		g) describe of the roles and responsibilities for all relevant employees involved in construction and demolition works associated with the project;	CEMPF Section 1.3		
		h) include arrangements for community consultation and complaints handling procedures during construction and demolition; and	CEMPF Section 9		
		i) be placed on Council's website within 2 weeks of its approval.		The copy of the CEMPF or contractor CEMP were not posted in WCC website. **Recommendation: It is recommended that WCC place the CEMPF on the WCC website.**	Non-compliant
		Note: Construction of the project shall not commence until written approval of this plan has been received from the Director-General.			
	Landfill Environmental Management Plan				
Sch 5	3	Prior to the commencement of operation, the Proponent shall update the draft Landfill Environmental Management Plan in the EA for the site to the satisfaction of the Director-General. This plan must:	LEMP September 2014	The LEMP has been prepared by Golder Associates and was approved by DPE on 11 December 2014.	Compliant
		a) be prepared by suitably qualified and experienced experts whose appointment has been endorsed by the Director-General	Prepared by Golder Associates		
		b) be prepared in consultation with the EPA and other relevant government agencies	LEMP Section 1.3 Consultation	The LEMP was sent to and reviewed by the EPA and other relevant authorities as per Section 1 of LEMP.	Compliant
		c) be approved by the Director-General prior to the commencement of operation;	LEMP Approval letter by DPE on 11 December 2014	The LEMP was approved by DPE on 11 December 2014.	Compliant
		d) describe in detail the management measures that would be implemented to address: • the relevant matters referred to in the Environmental	LEMP Section 3.1	Described in Section 3.1	Compliant

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		Guidelines for Solid Waste Landfills; • the conditions of this approval; and • requirements of the EPL;			
		e) include a copy of: • the relevant plans and programs required under this approval; • a quality assurance plan for the design and installation of the leachate management system and any capping of the landfill cells that covers the relevant issues outlined in sections 1 – 2 of Appendix A of the Environmental Guidelines for Solid Waste Landfills;	Section 6, 7, 8 LEMP Appendix E Whytes Gully Landfill Surface Water and Leachate Management Plan, 2008 Whytes Gully Landfill Leachate Management Study, 2002	Included relevant plans and programs.	Compliant
		f) describe the procedures that would be implemented to: • keep the local community and relevant agencies informed about the operation and environmental performance of the Project; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise during the course of the Project; and • respond to emergencies	LEMP Section 11 Appendix G Complaints Register Appendix P Community Education Program	Procedures and plans included in the LEMP Appendices and process defined in Section 11.	Compliant
		g) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the Project; and	LEMP Section 4	Structure and Responsibility defined in LEMP Section 4.0	Compliant
Sch 5	3	h) be placed on Council's website within 2 weeks of its approval.		At the time of the audit site inspections (hence for the audit period), the Draft LEMP was posted in DPE website, and the final LEMP was not posted on the WCC website. **Recommendation: It is recommended that WCC post the Final LEMP on the WCC website.** As of 26 February, the Final LEMP was located on the WCC website.	**Non-compliant**
	Management Plan Requirements				
Sch 5	4	The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	CEMPF August 2013 Approval Letter from NSW DPI ref 11/19432 LEMP, 11/12/2014 Approval letter from NSW DPE ref 14/19958	The LEMP and CEMPF and their associated sub-plans were developed and approved by DPE. Management plans have been submitted to DPE for review and approval in compliance to these requirements. The plans were approved on the following dates: • CEMPF 20 August 2013 Approval Letter from NSW DPI ref 11/19432 • LEMP, 11/12/2014 Approval letter from NSW DPE ref 14/19958 The auditors have not assessed the plans against this condition and assume that they have been complied with based on the approval from DPE.	Compliant
		a) detailed baseline data;		Detailed baseline data documented in LEMP and CEMPF subplans.	Compliant

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;		Documented in LEMP and CEMPF	Compliant
		c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;		Documented in LEMP and CEMPF	Compliant
		d) a program to monitor and report on the;		Documented in LEMP and CEMPF	Compliant
		• impacts and environmental performance of the Project;		Documented in LEMP and CEMPF	Compliant
		• effectiveness of any management measures (see c above);		Documented in LEMP and CEMPF	Compliant
		• a contingency plan to manage any unpredicted impacts and their consequences;		Documented in LEMP and CEMPF	Compliant
		• a program to investigate and implement ways to improve the environmental performance of the project over time;		Documented in LEMP and CEMPF	Compliant
		e) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the relevant limits and/or performance measures / criteria; and		Documented in LEMP and CEMPF	Compliant
		f) a protocol for periodic review of the plan.		The requirement for periodic review is documented in the LEMP and CEMPF. Based on discussions with WCC, annual reviews of the LEMP and CEMPF were not conducted. The latest version of the LEMP and CEMPF were dated 2014. Following issue of the Draft Report, WCC indicated that they consider completing the checklist provided in Section G of the EPL Annual Return as a review of the adequacy of the LEMP and CEMPF. **Recommendation: Implement a formal review process for the LEMP and CEMPF. Where relevant and based on the findings of the review, update the LEMP.**	**Non-compliant**
Annual Review					
Sch 5	5	One year after the commencement of operation, and annually thereafter, the Proponent shall review the environmental performance of the Project to the satisfaction of the Director-General. This review must: a) describe the operations that were carried out in the past calendar year;	Whytes Gully WWARRP - Annual Report and Annual Return 29 May 2016 - 28 May 2017	WCC provided Annual Reports that incorporate Annual Returns required under the Environmental Protection Licence for the years 2012-2013 to 2016-2017. The objective of the Annual Report is stated as being required under Condition R1.8 of the EPL which specifies	**Non-compliant**

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		b) analyse the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the • relevant statutory requirements, limits or performance measures/criteria; • monitoring results of previous years; and • relevant predictions in the EA;		that WCC must provide an Annual Report to accompany the Annual return for the site. The objective does not appear to reflect the requirements of this condition with thin the Project Approval. The Annual Report address some of the requirements of the condition, however, these reports do not consider compliance with the Project Approval nor meet all aspects of this condition. Specifically, the reports do not cover the following aspects of the condition: - 5a) describe the operations that were carried out in the last year; - 5b) third bullet point: Provide a comparison of results against the relevant predictions in the EA; or - 5c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; In summary, WCC are compliant with many aspects of the condition, however, the scope of current reports do not address some aspects of the condition. **Recommendation: It is recommended WCC increase the scope of the Annual Reports to address all of the requirements of Condition 5 (Schedule 5) specific to the Project Approval.**	
Sch 5	5	c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;			
		d) identify any trends in the monitoring data over the life of the Project;			
		e) describe what actions will be implemented over the next year to improve the environmental performance of the project (including a timeline for the completion of each action); and			
		f) be placed on Council's website within 2 weeks of its completion.			
	Revision of Plans & Programs				
Sch 5	6	Within 3 months of the submission of an:			
		a) audit under Condition 9 of Schedule 5;		Not yet applicable at this stage. This is the first audit commissioned by WCC.	Not applicable
		b) incident report under Condition 7 of Schedule 5; and		No incident was reported to have occurred to trigger changes or revisions of Plans.	Not applicable
		c) annual review under Condition 5 of Schedule 5, the Proponent shall review, and if necessary revise the plans and programs required under this approval to the satisfaction of the Director-General.		WCC to ensure that revisions of the plans and programs be conducted after the annual review as per above. If the audits and reviews of the plans had been carried out as required of the condition, this condition would have been triggered.	Note
		Note: This is to ensure the plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the Project		See Recommendations for Conditions 4 and 5 above.	
	REPORTING				

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
Incident					
Sch 5	7	The Proponent shall notify the Director-General and any other relevant agencies of any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment associated with the project as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of this incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident.	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	Incidents and non-compliances reported to EPL are recorded in the Annual Returns and these are kept on Councils publicly accessible website. None of the incidents reported were considered by WCC to comprise "*actual or potential significant off-site impacts on people or the biophysical environment",* hence no incidents were reported to DPE during the reporting period.	Compliant
Regular Reporting					
Sch 5	8	The Proponent shall provide regular reporting on the environmental performance of the Project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval, and to the satisfaction of the Director-General.	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	The following regular monitoring and reporting are posted on the WCC website: • Environmental Protection Licence 5862 - Annual Return • Whytes Gully Groundwater Monitoring -Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring - Conducted annually in August, and after any overflow event caused by rain • Whytes Gully Air Monitoring -Conducted monthly Auditors have not gone through all management plans to ascertain reporting requirements for each plan, and whether they have been included on the website.	Compliant
INDEPENDENT ENVIRONMENTAL AUDIT					
Sch 5	9	Within a year of the commencement of operation of the project, and every 5 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the Project. This audit must:	This audit	This audit is the first audit to be commissioned by WCC since Approval for the Project and since Stage 1 operation of new cell commencing in 2014. To comply with this condition an audit was required in 2015. An independent environmental audit was not conducted a year after commencement of operation of Stage 1, hence WCC are non compliant with the timing related to this condition.	**Non-compliant**
		a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;	Approval letter from DPE dated 2 August 2017.	Auditors for this audit were accepted and approved by DPE as: Michael Woolley – Lead Auditor; and Annabelle Tungol Reyes – Auditor.	Compliant

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
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		b) include consultation with the relevant agencies;	Records of consultation to be provided by MCW.	Consultation with agencies was conducted by Michael Woolley; Lead Auditor. Evidence of consultation is provided in the main report.	Compliant
		c) assess the environmental performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL (including any plan or program required under these approvals);		Environmental performance of the project is assessed in this checklist and in the main body of the report. Compliance with the EPL is assessed in a separate Checklist.	Compliant
		d) review the adequacy of any plans or programs required under these approvals; and, if appropriate;		Refer to the Audit Report Section 4. Review of Environmental Management Plans for details	Compliant
		e) recommend measures or actions to improve the environmental performance of the Project, and/or any plan or program required under these approvals; and		Recommendations are provided throughout this checklist and the main report. Section 6 of the main report includes a summary of recommendations.	Compliant
		f) be placed on Council's website within 2 weeks of its completion.		Noted. This is the responsibility of WCC once the audit report is finalised.	Note
		Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Director-General.		Auditors were accredited with Exemplar Global and were accepted and approved by DPE.	Compliant
Sch 5	10	Within 6 weeks of the completing of this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.		Noted	Note
ACCESS TO INFORMATION					
Sch 5	11	From the commencement of construction of the project, the Proponent shall make the following information publicly available on its (Council's) website as it is progressively required by the approval:			
		a) a copy of all current statutory approvals;	DPE Website http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4024 EPA website http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	Link in WCC website is available to the statutory approvals.	Compliant
		b) a copy of the current plans and programs required under this approval;	LEMP 2014 CEMPF 2013	The LEMP and CEMPF were not posted on the WCC website at the time of the site inspections and hence WCC are considered as non compliant with this condition. As of 26 February, the documents were sighted on the website.	**Non-compliant**
		c) a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	Monitoring results were sighted on and downloaded from the WCC website.	Compliant
		d) a complaints register, which is to be updated on a monthly	http://www.wollongong.nsw.gov.au/services/hous	All complaints are logged into Councils Customer Request	**Non-compliant**

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		basis;	ehold/Pages/wastesitesanalyticalmonitoringdata.aspx	Management System 'Pathways'. Complaints are reported to the community via the annual returns which are published on our website. WCC do not have a register of all complaints posted on the WCC website as required of the Condition. WCC have a complaints form in the LEMP, however, evidence of the use of this form was not provided by WCC and an Environmental Incident Report form was sighted for complaints. **Recommendation: It is recommended that a register of complaints, updated monthly, is provided on the WCC website.** **OFI: Update the LEMP with the form being used by WCC for the recording of complaints.**	
		e) a copy of the Annual Reviews (over the last 5 years);	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	EPA Annual Returns were posted on the WCC website.	Compliant
		f) a copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit; and		This is the first IEA. This audit report will need to be posted on the WCC website when finalised.	Note
		g) any other matter required by the Director-General.		Noted.	Note
APPENDIX 1 PROPONENT'S STATEMENT OF COMMITMENTS					
General		• Wollongong City Council would implement the Project in accordance with the EA and conditions of approval as provided by the determining authority	Documents referred to in this audit report.	Based on the findings of this audit WCC have generally implemented the project in accordance with the EA and conditions of approval, other than where Non Compliant and Not Verified conditions have been identified in this report.	Compliant
		• Wollongong City Council commit to considering the Concept Site Masterplan for future planning of resource recovery activities on the Whytes Gully RRP site. This includes consideration of an appropriate footprint for future resource recovery activities and access requirements.	Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July 2014)	WCC is committed by developing this strategy. This commitment is broader than the intent of this audit and has not been reviewed in full as part of this audit.	Compliant
		• By 2014 Wollongong City Council's Waste Strategy commits Wollongong City Council to reviewing available alternative waste technologies as identified in Wollongong City Council's Waste Strategy	Councillor Briefing Session conducted in March 2015	WCC had conducted Councillor Briefing Session in March 2015. This session included review of alternative waste technologies as identified in the Wollongong City Council's Waste Strategy. This commitment is broader than the intent of this audit and has not been reviewed in full as part of this audit.	Compliant
		• If the Project is approved, it is proposed that Wollongong City Council would surrender existing development consents of relevance to the Project site. This does not include the existing development consent for the MRF, which is not affected by the Project		Refer to Schedule 3; Condition 7.	**Non-compliant** Refer to Schedule 3; Condition 7.
Waste Management		• Wollongong City Council would implement the Project in accordance with the "Wollongong City Council	Wollongong Waste and Resource Recovery Strategy 2022 Action Plan (endorsed 28 July	WCC indicated that ongoing construction and operations are	Compliant

Whytes Gully Landfill Extension Project Minister's Condition of Approval 11_0094					
SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
Strategy		Waste and Resource Recovery Strategy 2012 to 2022" as provided in Appendix B and future updates of this document as relevant to the Project	2014)	based on this strategy.	
		• Detailed design of the Project would consider and address constraints and opportunities identified within the EA.	Detailed Design Report	Detailed Design Report noted constraints and opportunities within the EA.	Compliant
Environmental Management Plans		• A Construction Environmental Management Plan would be prepared and implemented to guide environmental management and monitoring activities during construction. The CEMP would include specific environmental issue subplans to reduce potential impacts and in accordance with relevant commitments identified within the EA and within this table. A monitoring program shall be conducted throughout the construction period to monitor compliance with the CEMP.	CEMPF 2013	Prepared by Golder Associates in 2013. Refer to CEMPF under condition 2; Schedule 5.	Compliant
		• The Landfill Environmental Management Plan (LEMP) would be implemented to be consistent with the draft LEMP provided in Appendix P. This includes implementation measures to guide environmental management and monitoring activities during operation as identified within the EA in addition to further specific issues identified within this Table.	LEMP 2014	Prepared by Golder Associates in 2014. Refer to LEMP under condition 3; Schedule 5.	Compliant
Noise		Wollongong City Council commit to the following with regard to noise:		See responses to Conditions for more discussion.	
		• All mobile equipment would be selected to minimise noise emissions. Equipment would be fitted with silencers and be in good working order.		Plant and equipment maintenance checklist and records provided.	Compliant
		• Broadband reversing alarms would be used for all site equipment.		Broadband reversing alarms were used as observed during audit inspection.	Compliant
		• Construction activities would be limited to the recommended construction hours where feasible and reasonable.		Construction works within standard working hours.	Compliant
		• Consultation with residents who are identified as potentially affected by cumulative and operational noise exceedances and communication of details of the construction and operational program on a regular basis.		Not triggered.	Not triggered
		• In accordance with Chapter 8 of the EPA "NSW Industrial Noise Policy" (2000), negotiated agreements would be commenced prior to construction of the appropriate stage of the Project with the affected community (i.e. Receiver N1 –Stage 3, Receiver N2 – Stage 2).		Not triggered	Not triggered
		• Provide a community liaison phone number and permanent site contact so that noise complaints would be received and addressed in a timely manner.		Provided in WCC website.	Compliant
		• ~~Submission of a noise impact assessment and associated mitigation measures for Stage 4-2b for~~		Not applicable	NA

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		~~approval prior to commencement of construction of Stage 42b.~~			
		• An active landfill gas management system would be installed including flaring and/or combustion to reduce potential greenhouse gas emissions from the landfill.		Flaring was conducted during audit inspection. Monitoring of gas manifolds was also conducted.	Compliant
		• Potential energy efficiency measures would be considered in the detailed design phase of the Project and be implemented and monitored through an Energy Savings Action Plan in accordance with the "Guidelines for Energy Savings Action Plans (DEUS 2005).		WCC indicated that OEH no longer require Energy Savings Action Plans and noted that in lieu of this, energy savings within Council are guided by their Draft Sustainable Buildings Strategy. Energy consumption is monitored on a continuous basis using a central monitoring system. Given that Energy Savings Action Plans are now no longer required, and given WCC have alternative approaches in place, this condition was considered Not Applicable.	NA
Erosion and Sediment Control		• An Erosion and Sedimentation Control Plan would be developed as part of the CEMP in general accordance with the following erosion and sedimentation control principles including:	CEMP 2013	Erosion and sedimentation control plans were provided for the construction works. Refer to Condition 21, Schedule 4 for discussion of Erosion and sediment controls and related OFIs.	Compliant
		o Construction of earth bunds and diversion drains upslope and around the perimeter of construction areas where surface disturbance occurs, to prevent clean surface water entering these areas.		Observations were made of construction of earth bunds and diversion drains upslope and around the perimeter of construction areas.	Compliant
		o Erection of silt fences or straw bales at strategic locations (i.e. around stockpiles) to manage the migration of fines		Silt fence were observed to be installed during audit inspection.	Compliant
		o Construction of temporary sediment retention ponds.		Temporary sediment pond was constructed within the construction works area.	Compliant
		o Dust suppression as needed.		Water cart was in operation for dust suppression.	Compliant
		o Reducing the surface area disturbed by construction activities at any one time.		Generally, disturbed areas were sprayed grass.	Compliant
		o Regular inspection and maintenance of sediment and erosion control structures.	Public Works Site Surveillance Inspection ERTECH Inspection records	Inspection checklist records were provided as evidence	Compliant
		o Protecting and retaining vegetation and surface cover where possible		Evidence at the site. Vegetation and surface covered retained.	Compliant
		o Placement of an erosion protection barrier (e.g. grassing) at the completion of works.		Observed during audit inspection	Compliant
		o Using designated access roads and paths where possible.		Designated access road were sealed.	Compliant
		o Removing soil adhering to the wheels and undercarriage of trucks (e.g. by wheel wash) prior to departure from the Project site.		Rumble grid in used at the construction site.	Compliant
		o Limit both the size of any stockpile footprints and the time between excavation and removal off-site of materials.		Stockpiles are sprayed grass.	Compliant

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		o Do not place stockpiles within 30 m of any watercourse.		Stockpile were placed uphill away from waterway.	Compliant
		o Stabilise all disturbed areas as soon as practicable. Temporary o vegetative destabilisation techniques must be applied to any disturbed soil to prevent areas remaining bare for more than 28 days.		Spray grass areas.	Compliant
		o Stabilise all temporary and permanent drainage immediately.		Drainage lined with rock beaching and stabilised.	Compliant
		o Maintain all sediments and erosion control measures in effective condition until the works are completed and the site is stabilised.		Controls are maintained and covered under the weekly inspection. See relevant discussion for the Conditions of Approval.	Compliant
		o Release "Dirty" Stormwater, captured and stored by sediment and erosion control measures or site works, after treatment and testing to confirm compliance with relevant criteria.	Surface monitoring results.	Testing of surface water to meet EPL criteria is conducted prior to release to waterways.	Compliant
		o A monitoring program shall be conducted by throughout the construction period to monitor compliance with the CEMP.		Public Works Surveillance Team conducts regular monitoring of the site controls with respect to construction.	Compliant
		• Proposed erosion and sediment control measures that would be applied during operation of the Project are outlined in the draft LEMP (Appendix P).	LEMP 2014 Section 7.2.3 Surface water and sediment controls	Erosion and sedimentation controls management is defined in LEMP and is implemented onsite e.g. swale with rock lining, use of rainflap, and stabilisation of exposed ground by spray grass. ERSED controls are discussed in detail in Condition 18.  	Compliant
Acid Sulfate Soils		In the event of discovery of Acid Sulfate Soils, procedures would be implemented/adopted to mitigate potential impacts on the		WCC reported that no acid sulphate soil had been	Not Triggered

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		environment in accordance with appropriate guidance and legislation and as identified in Chapter 12 of the EA.		discovered.	
Contamination		In the event of discovery of previously unidentified area(s) of potentially contaminated material, procedures would be implemented/adopted to mitigate potential impacts on the environment, employees and the public in accordance with appropriate guidance and legislation and as identified in Chapter 12 of the EA.	CEMPF Section 3.7 Contamination Management Plan	Procedure in place defined in CEMPF Section 3.7. WCC reported that no unidentified areas of contamination had been identified. Auditors were not able to verify this based on documents provided. A procedure is in place for unexpected finds of asbestos.	Not Triggered
Surface Water		• A Surface Water Management Plan would be developed as part of the CEMP in general accordance with the following control principles: o Bund fuels, oils, paints, and other chemicals onsite to comply with the requirements of relevant legislation o Bunds must be fitted with an impervious floor and must not be fitted o with a drain valve. o Remove accidental spills of soil or other materials.	ERTECH CEMP	Erosion and Sediment Control Plans and surface water management plan were included in ERTECH WHSE CEMP. This was not assessed by the auditors. See response to condition 2 Schedule 5.	Compliant
		• Wollongong City Council would commit to the following key principles in developing the surface water management controls for operation of the Project. o Diversion of clean drainage directly into Dapto Creek. Runoff from areas that are unaffected by the development would be allowed to discharge directly from the site to Dapto Creek. o Runoff from areas that are likely to generate sediment such as the new cell construction areas and stockpile areas would be directed into the Surface Water Ponds o Reduce the volume of runoff to Surface Water Ponds by reducing the contributing catchment area at any particular time. o Keep sources of different water quality types separate from each other. o Construction of a perimeter bund around the entire active landfill area to prevent surface water from entering the landfill area o Construction of a diversion drain around the entire landfill area to collect all runoff from disturbed areas (but outside exposed/uncapped active waste cell area(s)) which would drain to the sedimentation basin o The existing surface water ponds would be used for Stage 1 to 3 of the development o The Surface Water ponds would be downsized for Stage 4 onwards, as Stage 1 to 3 would be rehabilitated and runoff would be directed offsite to Dapto Creek. o Re-use 'dirty' water for dust suppression.	LEMP Appendix E WGL Surface Water and Leachate Management Plan	Surface water management controls for operation were developed as part of the LEMP. Surface water management discussed in response to Condition 18 Schedule 4.	Compliant

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Groundwater		• A Construction Quality Assurance (CQA) system would be implemented for cell construction. Detailed CQA requirements are embedded in the Technical Specification of the Design Report (Appendix 0).	Construction Completion Report for Cell 1A and 1B	Certification of implementation of QAQC system was included in Construction Reports. Refer to response to Condition 13; Schedule 4.	Compliant
		• During the operational phase of the Project a number of engineering measures and management strategies would be used to mitigate impacts to groundwater. Further documented within the EA these include o Leachate Barrier System and Leachate Collection System o Leachate Pond o Leachate Treatment Plant o Groundwater separation o Monitoring - A network of groundwater bores would be used to monitoring groundwater quality and trends at the Project Site. This would include a regular programme of groundwater sampling and assessment as detailed in the LEMP. - The leachate management system would be monitored in accordance with measures described in the LEMP including direct monitoring for the purposes of system integrity, leachate quantity and quality. - Groundwater Assessment Program to monitor background concentrations. If a significant change in concentration for any of the indicator parameters is detected over two consecutive monitoring periods, then the affected groundwater monitoring bores would be resampled and assessed and OEH notified (if required). Following this a groundwater remediation plan may be developed in accordance with the LEMP. - Combined surface water and groundwater monitoring program to gain an understanding of surface water and groundwater interaction and to assess potential impacts on the downstream environment including Dapto Creek and GDEs.	LEMP Appendix E WGL Surface Water and Leachate Management Plan 2008 WGL Leachate Management Study 2002	WCC operates and implement the following controls: • Leachate Barrier System and Leachate Collection System • Leachate Pond • Leachate Treatment Plant • Groundwater separation The following monitoring and reporting was conducted by WCC. • Whytes Gully Groundwater Monitoring -Conducted quarterly in February, May, August and November, and annually in August • Whytes Gully Stage 3 Bores & Surface Water Monitoring - Conducted quarterly in February, May, August and November. • Whytes Gully Surface Water Monitoring -Conducted annually in August, and after any overflow event caused by rain Refer to comments and findings for Condition 18 Schedule 4.	Compliant
Leachate Management		Wollongong City Council commit to the following with respect to leachate management: • Segregation of leachate from surface water and groundwater; • Maintain pond levels with adequate freeboard to minimise the potential for overflow. • Continue to monitor leachate discharge to sewer in accordance with Trade Waste Agreement.	LEMP Appendix E WGL Surface Water and Leachate Management Plan 2008 WGL Leachate Management Study 2002 MONITORING LANDFILL SITES MASTER Whytes Gully analytical data	WCC implements segregation of leachate from surface and groundwater through the installation of rain flaps, drainage system and capping layer. Refer to Conditions 17 and 18; Schedule 4 for discussion of Leachate Management.	Compliant
Flora and Fauna		Wollongong City Council commit to the following to ensure the Project maintains or improves the biodiversity values of the region.			

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		• Clearing for the purposes of bushfire protection would be restricted to non-native vegetation communities (Acacia Scrub/Exotic, Closed Exotic Grassland, Planted). In accordance with the Bushfire Assessment, clearing or trimming of the Illawarra Subtropical Rainforest on the site is proposed to be avoided.	LEMP Appendix O Vegetation and Biodiversity Management Plan	These commitments are included in the vegetation and biodiversity management plan.	Compliant
		• Removal of native vegetation communities and fauna habitats during construction and operation of the Project be avoided and minimised where possible.		Documented in the Biosis Report July 2017	Compliant
		• Undertaking two additional targeted surveys for the Green and Golden Bell Frog in the peak breeding season to confirm results of targeted surveys undertaken in November/December 2011 and early January 2012.	Whytes Gully New Landfill Cell – Terrestrial and Aquatic Flora and Fauna Assessment (May 2013)	WCC provided a Whytes Gully New Landfill Cell – Terrestrial and Aquatic Flora and Fauna Assessment (May 2013). A flora and fauna assessment has been conducted for the Study Area in regard to the proposed Whytes Gully New Landfill Cell. *This assessment has recorded one EEC and two threatened fauna species within the Study Area and has concluded an additional seven fauna species were considered likely to occur within the Study Area and may potentially be impacted by The Project. Targeted surveys for the GGBF and APS did not record these species and they were subsequently deemed a low likelihood of occurrence.* *Assessments of Significance for these EEC and species have concluded that, providing recommended avoidance and mitigation measures are adhered to, The Project is unlikely to have a significant impact on the threatened species or the EEC assessed."*	Compliant
		• Waterbody removal and associated vegetation removal being undertaken over the spring or summer months when fauna species are most active.		Documented in Biosis Report July 2017	Compliant
		• Undertaking protection of all retained trees. Tree protection measures such as temporary fencing will be implemented for any trees potentially indirectly impacted by the Project.		Documented in Biosis Report July 2017	Compliant
		• Installation of protective fencing around all retained native vegetation. This is particularly important for areas of ISTR EEC where there is a risk of indirect impact.		Documented in Biosis Report July 2017	Compliant
		• Installation of sediment and erosion controls as required including for potential indirect impacts to the ISTR EEC.		Erosion and sediment controls implemented as required. These are discussed in Condition 18: Schedule 4.	Compliant
		• Ensure machinery parking, equipment or materials storage compounds, temporary stockpiling of excavated material and work areas are outside sensitive natural features including retained native vegetation, wetlands and drainage lines.		Compliant as per observation during audit inspection.	Compliant
		• Logs removed with any vegetation removal would be relocated into areas of retained vegetation, for the purpose of providing fauna habitat.		Documented in Biosis Report July 2017	Compliant
		• A weed control program would be undertaken in accordance with the LEMP.		Documented in Biosis Report July 2017. See recommendations made in relation to weed management in response to Condition 45; Schedule 4.	Compliant

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SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		• Undertake revegetation of cleared and disturbed areas using a range of native species of local provenance for the purpose of managing weeds, controlling soil erosion, and maintaining fauna habitat in accordance with the Landscape Strategy (Appendix N)		Documented in Biosis Report July 2017	Compliant
		• Maintain suitable buffer distances from nearby waterways. These buffer distances are recommended based on the stream orders of waterways and the subsequent categories identified within the "Wollongong City Council Development Control Plan 2009".		Documented in Biosis Report July 2017	Compliant
		• Following the disturbance of existing surface water ponds, landscaping would be undertaken to enhance existing riparian zone vegetation associated at the ponds to be in accordance with appropriate riparian buffer widths. The vegetation buffer is proposed to be constructed to an average width of 5 metres where possible to improve the existing aquatic habitats.		Documented in Biosis Report July 2017	Compliant
		• Extend the current water quality monitoring program to include one monitoring location on Dapto Creek, upstream of the discharge point and two locations downstream.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data Annual Report to EPA	Sampling locations on Dapto Creek is implemented.	Compliant
		• Biodiversity and habitat values would be maintained and increased where possible by planting a range of indigenous species.	LEMP Appendix O Vegetation and Biodiversity Management Plan	Documented in Vegetation Management Plan.	Complaint
		• Offsetting measures, and measures to monitor the success of these offsets, would be outlined in a Vegetation Management Plan.			
Air Quality	Wollongong City Council commits to the following with regard to air quality				
		• Watering of unsealed haul roads and disturbed surfaces (including construction areas).	Documented in LEMP 8.0 Air Quality Management Site inspection Plant Daily Inspection Matrix Whytes Gully SOP Placement & Compaction of waste Whytes Gully Air Monitoring -Conducted monthly.	The following dust management practices were observed on site: • Water cart was observed during inspection.	Compliant
		• Restricting the size of disturbed areas as much as practicable.			
		• Disturbed areas would be rehabilitation progressively in accordance with the Landscape Strategy.			
		• Prevention of truck over-loading and covering dusty loads.			
		• Washing down trucks before they leave the site.			
		• Maintaining equipment and plant appropriately to ensure efficient operation.			
		• The active landfill area would be covered following the completion of waste placement at the end of each day with landfill lids or approximately 150 mm of daily cover material or other cover system.			
		• Adhering to appropriate hours of construction and operation.			
		• Temporarily suspending operations under extreme wind speed conditions			
		• Giving consideration to reducing the footprint of the active cell			

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		area and daily cover and increasing the thickness of daily cover to control odour as required, particularly during the operation of Stage 1 during waste relocation works and Stage 4. • An air quality (including dust and odour) management strategy would be incorporated into the CEMP. • Monitoring in accordance with the EPL and ongoing assessment.		 • Exposed area is restricted. Evident during site inspection. • Disturb areas is sprayed grass and will be landscape. • Air monitoring is conducted. • Odouriser was in operation during site audit. • Small tip face to restrict cover material. • Spray grass of Cell 1A. • Loads covered when leaving site. • No wheel washing. • Non-conformance was given to truck that track mud offsite. Other dust management measures are discussed on response to Condition 29; Schedule 4.	
Traffic and Transport	Wollongong City Council commit to: • Appropriate management and maintenance of road pavement of Reddalls Road intersection to Whytes Gully RRP and site access. • The CEMP for the Project would include a traffic management plan identifying truck movements to and from the site, internal access, interactions with general public, parking and access requirements for construction personnel and safety signage and training of personnel in traffic management in accordance with relevant requirements and guidelines of the RTA in terms of road safety and network efficiency. • Where possible, trucks to the site would be scheduled to avoid peak hour and within standard hours of operation, except in emergencies.	LEMP Section 9.8 Traffic Control Princes Highway Reddalls Road Intersection Upgrade design Stage 2 Traffic Management Plan	WCC had demonstrated commitment based on the evidences presented i.e. development of traffic controls in LEMP, CEMP Traffic Management Plan, and upgrade of Reddalls Road Intersection. RMS were consulted with respect to WCC operations as part of this IEA by the auditors and did not raise any issues.	Compliant
Heritage	Wollongong City Council commit to the following with regard to heritage (indigenous and non-indigenous):		Location of heritage significant areas within WGRRP were	Compliant

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SCH#	**No.**	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		• Registered Aboriginal parties identified within the EA would be informed about the management of Aboriginal cultural heritage sites within Whytes Gully RRP where they may be impacted upon by the Project.	LEMP Figure 7 Heritage	identified in Figure 7 of LEMP. WCC noted that the heritage areas are out the current WGL footprint. Included in the induction package of ERTECH. Refer to response to Condition 47; Schedule 4.	
		• Identified potential archaeological deposits within the Whytes Gully RRP site would be left in their identified location and not salvaged unless the Project cannot avoid impacting upon these sites. If salvage is required Wollongong City Council would consult with the relevant statutory bodies and provide an opportunity for collection of the cultural material from the site.			
		• Monitoring of construction would be completed for the Project where in proximity to listed heritage items (i.e. Glengarry Cottage) to ensure there is no disturbance to heritage significance.			
		• A heritage induction including indigenous and non-indigenous heritage is proposed to be incorporated within the general induction during construction of the Project.			
		• Should indigenous or non-indigenous cultural material be identified during any works, construction and/or operation will cease in the vicinity of the find and the appropriate representative at OEH will be contacted.			
Visual		Wollongong City Council commit to:	LEMP Appendix L Landscape Strategy	Landscape strategy is documented in LEMP. Refer to Condition 40; Schedule 4.	Compliant
		• Staging and planning of landfill activities to reduce the extent to which they would be visible during the construction and operation of the Project.			
		• Implementation of the Landscape Strategy (Appendix N of the EA) to reduce and manage potential long term visual impacts			
		• Reducing the area of un-vegetated landfill slope, both permanent and temporary, by staging the operations and progressively establishing a vegetation cover on each section of slope as they are completed.			
		• Revegetating the proposed landfill slopes with mix of shrubs and small trees and grass to create a landscape character similar to adjoining rural areas	Vegetation Management Plan	Documented in the LEMP.	Compliant
		• Adopting design options (when suitable) to be in keeping with the surroundings of the site including native grasses and dark toned colours for existing and proposed structures to reduce their visual contrast with their landscape setting.	LEMP Appendix L Landscape Strategy	Landscape strategy is documented in the LEMP.	Compliant
		• Consulting with residents (as identified within the relevant chapter of the EA) to discuss the potential for planting to be carried out close to their houses to screen views of the landfill operations.		No planting close to residents.	Not triggered
		• Subject to bushfire protection requirements (such as trimming of mature trees), existing native vegetation would be retained where possible to provide visual screening and contribute to the landscape character of Whytes Gully RRP.	Updated Vegetation Management Plan	Documented in the LEMP.	Compliant
		• Screen planting with dense tall tree planting on natural ground would be used to block views to the site, particularly from	LEMP Appendix L Landscape Strategy	Landscape strategy is documented in the LEMP.	**Non-compliant**

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		adjoining residences.		Section 4 of the Landscape Strategy states that "the proposed planting along sections of the site boundary is intended to provide visual screening of the landfill operations from adjoining properties. In order to fulfil this function, the planting will need to be carried out in advance of landfill operations. A minimum of 5 years growth will be required to provide the intended visual screening. WCC did not provide evidence of where trees have been planted for screening purposes. Minutes of the Whytes Gully Reference Group meetings on 24 May and 22 November 2017 indicated questions from members as to why screening trees had not been planted at the boundary of the site. **Recommendation: WCC to conduct screen planting with dense tall tree planting on natural ground to block views to the site, particularly from adjoining residences.**	
Socio-economic	Wollongong City Council commit to ensuring: • A Stakeholder Strategy would be implemented throughout the delivery of the Project. Provided within environmental management documentation (LEMP) the Stakeholder Strategy would provide procedures for communication with stakeholders, procedures for the dissemination of information to the community, identification of the communication channels available for the community and stakeholders to provide feedback on the Project, a protocol for the Project to respond to any enquires or feedback and for managing site visits and property inspections. • Implementation of measures to reduce the potential for construction and operation impacts upon amenity as identified within the relevant chapters of the EA and the draft Statement of Commitments.	LEMP Appendix P	Appendix P of the LEMP provides for a community education program. WCC stated that the community website also provides a function to meet this condition. This did not appear to be a specific stakeholder strategy for the Landfill Operations.	Compliant
Hazards and Risks	Wollongong City Council commit to ensuring: • No smoking around plant equipment and within designated areas only. • Any dangerous goods would be stored in accordance with normal dangerous goods storage procedures. • Spill containment to be managed in accordance with relevant Australian Standards. • Safety hazards would be managed through occupational health and safety procedures. • Environmental hazards would be managed through the CEMP and LEMP.	Safety Management Plan SMP Induction TEMPLATE Checklist CURRENT June 2016 LEMP 2014 CEMPF 2013	Evidence of demonstration at the site was observed and included in the Safety Management Plan Induction Checklist for all visitors and employees. No smoking signs observed at the WGL compound and offices. Spill bunding was available for plant and the hazardous materials sighted.	Compliant
Hazards and Risks	• Fire protection (including fire extinguishers, separation distances) would be provided in accordance with relevant Australian Standards and as identified within the EA.	Flood Emergency and Evacuation Plan	Fire extinguishers and fire hydrants are available and maintained. The Auditors are not fire experts and an assessment of compliance with this commitment was not undertaken.	Compliant

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		• Fire suppression and protection systems serviced and inspected periodically.		Fire extinguisher serviced periodically. The Auditors are not fire experts and an assessment of compliance with this commitment was not undertaken.	Compliant
		• Water carts would continue to be made available at the site.		Water cart always available on site.	Compliant
		• Site emergency response plan including emergency contact numbers provided within management system for the site.	LEMP Appendix A Emergency Response Procedures and Plan Pollution Incident Response Management Plan (PIRMP) V03, 2017	Emergency Response Plan and PIRMP are available and implemented. WCC had conducted emergency evacuation drill on January 2017.	Compliant
		• The site landscaping would not exceed a fuel load of 2 t/ha.	Landscape Strategy	WCC implementation of Landscape Strategy. Site view at the top of the hill. WCC reported that they consider that the current landscape does not exceed a fuel load of 2 t/ha. 	Compliant
		• Planted trees that are retained on the site would have the lower branches trimmed (cut off) to a height of 2 m above the ground. The tree trimming works may be staged with priority given to the protection of assets and fuel load reduction adjacent to roads.		Planted trees have lower branched trimmed. Not all areas were inspected to determine this. 	Compliant
		• An asset protection zone (APZ) of 10 m would be maintained around existing site buildings.		WCC stated that an asset protection zone of 10 m is maintained, however this was not verified b auditors.	Compliant
		• A perimeter firebreak of 5 metres be established around the entire Whytes Gully RRP site and around buildings (roads and access tracks including offsite roads and tracks, may be utilised to form the fire break).		WCC stated that a perimeter firebreak of 5 metres is established around the WGRRP. This was fully verified by Auditors.	Compliant

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		• Wind-blown litter would be managed as outlined in the LEMP.	Extract from Trim (records management system) Community Service Attendance Records - Litter collection	Litter collection is conducted. Refer to Condition 9; Schedule 4 for discussion and OFIs.	Compliant
		• Coordination of vegetation planting and removal with bushfire management requirements that include access tracks and fuel management zones.	LEMP Appendix O: Vegetation and Biodiversity Management Plan	Defined in Vegetation and Biodiversity Management Plan. Aspects relating to bushfire management were not assessed during the audit.	Compliant
		• Flammable materials would be removed from site fencing as outlined in the LEMP.	LEMP Operating procedures	Defined in operating procedures. No flammable materials were observed on site fencing.	Compliant
		• The LEMP would be implemented to ensure reduction of hazards and risk associated with delivery and/or processing of waste.		Comments on implementation of the LEMP are made throughout this document. A risk and hazard assessment was not conducted as part of this audit.	Compliant
		• A Vegetation Management Strategy (including Weed management) would be developed within the LEMP to ensure that vegetation is managed to not exceed recommended fuel loads in relevant guidelines.	LEMP Appendix O Vegetation and Biodiversity Management Plan	Developed and included in LEMP.	Compliant
		• The general public would not be allowed direct access to the landfill.		No direct access to the landfill was observed during site inspections. Fencing around the WGRRP and security at the weigh bridge.	Compliant
		• Security of the site would be maintained during construction and operation including security fencing, which is locked after hours of operation.	LEMP Section 9.2 Security of Site	Security is maintained at the construction site and operations. Construction areas are fenced. Access to landfill is only through the weighbridge. A camera is installed at the weighbridge. 	Compliant
		• Waste entry and flows would be monitored and controlled in accordance with the LEMP.	LEMP Section 5 Gatehouse operation	Waste entry and flows was observed during site audit. Waste entry is through the weighbridge and signage are available to direct truck drivers where to go.	Compliant
Rehabilitation and Final landform		Wollongong City Council commit to: • Development of a final landform that integrates with the surrounding landscape and environment. • Implementing of the Design Report to ensure that appropriate capping of the landfill is completed progressively throughout the Project. • Implementing the LEMP to ensure appropriate post closure monitoring and maintenance. This includes contingency and	LEMP Section 10 Site Closure	LEMP Section 10 Site Closure outlines the proposed approach for site and rehabilitation. Implementation of the LEMP and SOP for Placement and Compaction of waste was observed during the site audit. Final landform rehabilitation is yet to be implemented.	Compliant

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		remediation measures should environmental monitoring indicate that the closed landfill is impacting upon air, surface water, groundwater or amenity of nearby receptors. This also includes procedures for maintaining the landfill surface post closure and repairing damage to the capping system.			
Stakeholder Engagement		Wollongong City Council commit to ongoing regular consultation with the community on the Project through:			
		• Community Consultative Committee for the Whytes Gully RRP.	http://www.wollongong.nsw.gov.au/council/haveyoursay/Pages/default.aspx http://www.wollongong.nsw.gov.au/council/meetings/Pages/default.aspx	WCC provided minutes of the Whytes Gully Reference Group for 22 November 2017; 24 May 2017; 23 November 2016; and 20 May 2015.	Compliant
		• Phone line to communicate issues to Whytes Gully RRP management.	http://www.wollongong.nsw.gov.au/customerserviceonline/feedback/Pages/default.aspx	A general complaints line is available on the WCC website. This is not specific to the Whytes Gully RRP. Often for facilities such as landfills; a site specific complaints line is required. **OFI: It is suggested WCC consider better advising of the complaints line to Council on Whytes Gully related web pages and other media, to make it more transparent how complaints to the facility can be made.**	Compliant
		• Complaints management process (as provided in the draft LEMP).	Extract from Pathways (one of records management system) - Air Pollution Complaints for Whytes Gully	WCC reported that all complaints/correspondence lodged with Council or via EPA are logged in databases Pathway and/or Trim.	Compliant
		• Clear signage at construction sites during construction.		Clear signage of construction site was observed. Construction area is fenced.	Compliant.
		• Stakeholder satisfaction surveys and feedback forms (as part of wider Wollongong City Council activity).	http://www.wollongong.nsw.gov.au/customerserviceonline/feedback/Pages/default.aspx	Available on the WCC website.	Compliant
		• Ongoing use of interactive web-based activities including updates of the Project website.	http://www.wollongong.nsw.gov.au/services/majorprojects/Pages/WhytesGullyLandfillProject.aspx	WCC website available with project updates.	Compliant

Appendix B
Compliance Table – EPL 5862

Appendix B

Environmental Protection License (5862)
Whytes Gully Landfill Extension Project

Table B: Whytes Gully Landfill Extension Project Environmental Protection License (5862), Licence Version date 5 July 2017

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
1 Administrative Conditions				
A1	What the licence authorises and regulates			Noted
A1.1	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.			Noted
	Scheduled Activity / **Fee Based Activity** / **Scale** Waste disposal (application to land) / Waste disposal by application to land / Any capacity			
A2	Premises or plant to which this licence applies			Noted
A2.1	The licence applies to the following premises:			Noted
	Premises Details WHYTES GULLY WASTE DISPOSAL FACILITY REDDALLS ROAD KEMBLA GRANGE NSW 2526 LOT 2 DP 240557, PART LOT 52 DP 1022266, PART LOT 53 DP 1022266, PART LOT 501 DP 1079122, PART LOT 502 DP 1079122 THE PREMISES BOUNDARY IS DEPICTED BY THE AREA BOUNDED IN GREEN ON THE DRAWING LABELLED "WHYTES GULLY WASTE DISPOSAL FACILITY SITE BOUNDARY PLAN - 2 JULY 2014" (EPA REF DOC14/116147)			Noted
A3	Information supplied to the EPA			Noted
A3.1	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition, the reference to "the licence application" includes a reference to: a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.	Annual Return Reports http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued Whytes Gully tonnage data - waste and recycling MONITORING LANDFILL SITES MASTER Whytes Gully analytical data Whytes Gully Recycling and Waste Data	Based on the interview with the WCC Operations Manager, annual returns reports to EPA and records provided to the auditor (i.e. monitoring data, weigh bridge data), design reports, construction QAQC reports and inspection at the site, works and activities at the Whytes Gully Landfill have been carried out in accordance with the proposal contained in the license application. This checklist provides an assessment of compliance against each of the conditions below.	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		117625003-317-R-Rev0 - Whytes Gully P1A Completion Report 137625004-261-R-Rev0- Completion Report P1B		
A3.2	The Whytes Gully Landfill Environmental Management Plan (LEMP), dated March 2012 is not to be taken as part of the documentation in A3.1, other than those parts specifically referenced in this licence			Noted
2	**Discharges to Air and Water and Applications to Land**			
P1	Location of monitoring/discharge points and areas	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns 2014 to 2016 http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	The location of monitoring/discharge points and areas in the EPL were defined in the Monitoring Landfill Sites Master Whytes Gully Analytical Data Register and were monitored as per the requirement of the EPL. Annual Returns report to EPA presented the annual summary of monitoring and analytical results as per the locations identified in the EPL.	Compliant
P1.1	The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point. Refer to EPL for Table.			
P1.2	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point. Refer to EPL for Table.			
3 Limit Conditions				
L1 Pollution of waters				
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	Based on the Annual Returns and analytical monitoring data penalty notices, non-compliances against the EPL 5862 were reported from 2014 up to the date of this audit 27 November 2017 as stated in above condition A3.1. However, WCC noted that there was no material harm to the environment reported during the occurrence of the non-compliances against L2.1 and L2.4.	Compliant
L1.2	There must be no discharge of contaminated stormwater to waters under dry weather conditions (less than 10 mm of rainfall within a 24-hour period) or a storm event/s of less than 1:10 year, 24-hour recurrence interval (less than 297.4 mm of rainfall within a 24-hour time period). Discharges of contaminated stormwater from the stormwater ponds caused by a 1:10 year, 24-hour recurrence interval storm event or greater do not constitute a breach of this licence.	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	Based on the Annual Returns and analytical monitoring data there were no reported non-compliance of this condition.	Compliant
L1.3	There must be no discharge of leachate to waters under dry weather conditions (less than 10 mm of rainfall with a 24-hour period) or storm event(s) of less than 1:25 year, 24-hour recurrence interval (less than 371.5 mm of rainfall within a 24-hour period). Discharges of leachate from the leachate pond caused by a 1:25 year, 24-hour recurrence interval storm event or greater do not constitute a breach of this licence.	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id	Prior to the landfill upgrade (and this audit period), following heavy periods of rain, there were overflows of leachate to the storm water dam in June 2007, November 2007, December 2007 & February 2008. Appropriate Actions were taken by licensee. (4 occurrences). There was no reported breaches against this condition since the	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	upgrade of the landfill from 2014 and up to the date of last audit inspection 27 November 2017. WCC stated that there was no breach of this condition.	
L2 Concentration limits				
L2.1	For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	Based on the monthly reports posted in WCC council and annual returns to EPA, there were 3 occurrences of non-compliances reported to EPA since 2013 against this condition: • L2.1/L2.4 - Exceed TSS Concentration Limit at LDP1 (x1, minor) after heavy rainfall event on 25/08/2015 (approximately 150mm over 24hours). Action taken by licensee. EPA has written to licensee regarding non-compliance and relevant action. (1 occurrence); • L2.1/L2.4 -Exceed limit for TSS at LDP 1 (minor) on 2 occasions due to high intensity rainfall events in June and July 2016. The licensee is addressing non-compliances. EPA has written to licensee regarding non-compliance and relevant action. (2 occurrences). Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. WCC consider these are historic results and that it has implemented amended controls to eliminate recurrence. WCC consider that controls implemented are performing as designed. Specifically, a Wet Weather and Stormwater Management Work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events. Since the implementation of the new work instruction, there were no further reported elevated TSS discharges. There was no reported exceedance to the water/land concentration limits since July 2016. Based on the exceedences of the criteria as reported, WCC is assessed as Non compliant with this condition. Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. It was not evident that these events were reported to the EPA based on documents sighted. **Recommendation: It is recommended that WCC continue to monitor the effectiveness of the controls defined in the Wet Weather and Stormwater Management work instruction and implement additional mitigation measures as required.**	**Non-compliant**
L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20li	Based on the Annual Returns and analytical monitoring data, there were no reported breaches of pH criteria during the 2014 to 2017 monitoring.	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		cence&prp=no&status=Issued		
L2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	Analytical monitoring data provided by WCC indicates that analysis is also conducted on samples from LDP1 for the following analytes: Alkalinity (as Calcium Carbonate), Ammonia, Calcium, Chloride, Conductivity, Dissolved Oxygen, Filterable Iron, Fluoride, Magnesium, Nitrate, Potassium, Sodium, Sulfate, Temperature, Total Phenolics, and Total Organic Carbon. Water is also sampled and analysed at upstream and downstream locations (EPA points 33 and 34). On the basis of this additional sampling results, WCC are considered compliant with this condition, however Auditors did not review the data provided to assess whether pollution may be occurring for pollutants other than those specified in the table\s.	Compliant
L2.4	Water and/or Land Concentration Limits (for LDP1).	Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	Refer to L2.1	Refer to L2.1
L3 Waste				
L3.1	The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below. Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below. Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below. This condition does not limit any other conditions in this licence.	Whytes Gully tonnage data- waste and recycling SOP - Weighbridge Procedure Accepting eWaste under the product stewardship program Procedure ewaste, mattresses and tyres, storage and removal – WWRRP Whytes Gully Weighbridge Cash Handling procedures Compliance checklist Whytes Gully Waste Depot weighbridge cash handling procedures Acceptance of VENM at Landfill Asbestos Detection & Treatment at Whytes Gully Safe Operating Procedure TEMPLATE Daily Inspection -Tip Face - Whytes Gully Waste Depot CURRENT Capture Training Records	Acceptance of wastes process is defined in the LEMP and standard operating procedures were available to help ensure that only waste allowed in the EPL will be accepted. The procedures were provided to the auditor as follows: o SOP - Weighbridge Procedure o Accepting eWaste under the product stewardship program o Procedure ewaste, mattresses and tyres, storage and removal – WWRRP o Whytes Gully Weighbridge Cash Handling procedures o Compliance checklist Whytes Gully Waste Depot weighbridge cash handling procedures o Acceptance of VENM at Landfill o Asbestos Detection & Treatment at Whytes Gully Safe Operating Procedure The following records were also provided as evidence to fulfil this condition: • Whytes Gully tonnage data- waste and recycling • Annual Returns 2016-2017 • Brochure or Flyer given to community defining which wastes are acceptable including fees and charges. • Capture Training Records • Example record of rejected loads report from September 2016 - September 2017	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		Annual Return 2016-2017 http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	Based on the document and records provided above, specifically the record of rejected wastes, WCC demonstrate compliance in assessing and acceptance of waste at the landfill. However, it is noted during audit inspection that by the nature of enclosed vehicles entering the site, there is always a potential for wastes to be inadvertently received that is not allowed at site. The auditors did not undertake any reviews of the waste to verify full compliance with this condition.	
L3.2	The licensee must not dispose of any tyres on the premises which; a) have a diameter of less than 1.2 metres; and b) are delivered at the premises in a load containing more than 5 whole tyres; and c) became waste in the Sydney Metropolitan Area. Note: This condition does not apply where: i) The tyres received comply with the EPA Tyre Disposal Specifications; or ii) The premises have the capacity, at the time of unloading the tyres, to comply with the EPA Tyre Disposal Specifications; or iii) The premises have the capacity, at the time of unloading the tyres, to recycle or reprocess the tyres into a saleable product, including rethreading the tyres.	Whytes Gully tonnage data-waste and recycling Brochure or Flyer given to community defining which wastes are acceptable including fees and charges.	As per the brochure provided by the WCC to the community and as per the waste and recycling data, the landfill accepts tyres. The specifications of tyres and cost are noted in the brochure. Large plant and tractor tyres are not accepted in the premise. 	Compliant
L3.3	Tyres stockpiled on the premises must: a) not exceed fifty (50) tonnes of tyres at any one time; and b) be located in a clearly defined area away from the tipping face; and c) be managed to control vermin; and d) be managed to prevent any tyres from catching fire.	Site inspection	No tyres were observed during the site audit inspection. There was a recycling area set up at the site for the tyres to be stored. Based on the waste and recycling tonnage data there was less than a tonne of tyres accepted in calendar year 2016. 	Compliant
L4 Potentially offensive odour				
L4.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.	Site inspection Complaints Records	During the first audit inspection on 11 September 2017, a deodouriser was in operation at the time of the first site inspection for this audit adjacent to the tipping face. No offensive odour beyond the site	**Not Verified**

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		Odour Compliant Investigation Report for 7 March 2017	boundary was observed during this site inspection. In most areas of the site, odour was not considered offensive.  However, during the second visit on 27 November 2017, the odouriser was not in operation and odour was noted at the eastern gully area. It was also noted that a larger (bit still relatively contained) tip face was observed during this day. See photo below.  Based on the latest site inspection (27 November 2017) it was concluded that the odouriser is not being used all the time. Minutes of the Whytes Gully Reference Group meeting on 24 May 2017	Refer to recommendations made in the MCoA Checklist for Conditions 23 and 26; Schedule 4.

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
			indicated that one member *"mentioned the smell in the morning when the lids are lifted. It was advised that the deodoriser trailer is turned on prior to site start up to minimise odour generated. Another member mentioned that sometimes the smell is as late as 10:00am."* No mention of odour was made in the Minutes of the Whytes Gully Reference Group meeting on 22 November 2017. Selected incident reports were provided by WCC for odour complaints on 24 November 2016 (1 complaint); 6 March 2017 (4 complaints); and 17 March 2017 (4 complaints). The reports showed that complaints are followed up with weather data and other factors documented. The EPA issued a letter to WCC dated 30 March 2017 responding to a letter from WCC dated 21 March 2017 in relation to odour complaints made in March 2017. The EPA noted that the identified the cause of the complaints relates to a premises not under the control of WCC. Refer to recommendations made in the MCoA Checklist for Conditions 23 and 26; Schedule 4.	
4 Operating Condition				
O1 Activities must be carried out in a competent manner				
O1.1	Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	LEMP SOP Placement & Compaction of waste EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017 SOP - Weighbridge Procedure Accepting eWaste under the product stewardship program Procedure eWaste, mattresses and tyres, storage and removal – WWRRP Whytes Gully Weighbridge Cash Handling procedures Compliance checklist Whytes Gully Waste Depot weighbridge cash handling procedures Acceptance of VENM at Landfill Asbestos Detection & Treatment at Whytes Gully Safe Operating Procedure TEMPLATE Daily Inspection -Tip Face - Whytes Gully Waste Depot CURRENT Annual Returns	The operational processes for the landfill are defined in the LEMP and various WCC procedures. Implementation of these procedures was observed during the site inspection at the time of this audit such as: • Weigh Bridge entry and exit with dockets • Trucks entering landfill • Trucks unloading wastes • Excavator compacting waste • Excavator covering waste with acceptable material • Odouriser in operation • Recycling area activities Not all aspects of the WCC operations were considered by the auditors or assessed under this condition. Based on the observations on site and documents provided, WCC are generally compliant with this condition.	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
		http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued		
O2	Maintenance of plant and equipment			
O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Plant Daily inspection Matrix Whytes Gully Waste Asset Maintenance Records Register John Deer Loader Maintenance	The assessment of compliance to this condition was limited to the following records provided to the auditor: • Plant Daily Inspection Matrix Whytes Gully • John Deer Loader Maintenance • Waste Asset Maintenance Records Register included the following maintenance of waste facility assets: o AE79SP Komatsu PC 220-7 (P94401) o IVECO STRALIS 8x4 Hook truck (93701) o BG91EH Caterpillar Loader 950H (P95212) o Caterpillar Compactor 836H SERIES (P94242) o John Deere Tool Carrier R/T Loader 544K - BP02TI o Water pump at Whytes Gully Tip 94/95 year o Water pump at Whytes Gully Tip 05/06 year Not all aspects of the WCC operations were considered by the auditors or assessed under this condition. Based on the observations on site and documents provided, WCC are generally compliant with this condition. The maintenance of the newly constructed assets and water treatment facility were not covered in this review.	Compliant
O3	Dust			
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	LEMP SOP use of water truck Site Inspection Dust Monitoring Monitoring Landfill Sites Master Whytes Gully Analytical Data Annual Returns http://app.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=5862&id=5862&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued	The process for dust control is defined in LEMP. There was no visual dust observed during the site inspections for this audit. Examples of dust mitigation measures included: • The haul road is sealed, • The water cart is used on unsealed haul roads. There are 5 dust monitoring gauges (DDG1-DDG5) installed around the site and monitored on a monthly basis with the following analytes: - Ash Content - Combustible Matter - Total insoluble matter Based on the results from March- July 2017, there was no noted significant increase on the concentration. There is no dust criteria set in the EPL. Water cart in operation:	Compliant
O3.2	All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.			

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
			 Discussion on dust management is also covered under Conditions 24-26; Schedule 4 of the MCoA.	
O4	Emergency response			
O4.1	The licensee must extinguish fires at the premises as soon as possible.	LEMP Pollution Incident Response Management Plan	The firefighting capacity is defined in the LEMP. A Pollution Incident Response Management Plan is in place and defines the emergency response to extinguish fires at the premise as soon as possible. Fire extinguishers and fire hydrants are in place and maintained. No fires were observed during site inspections for the audit. See discussion of fires in the MCoA Checklist.	Compliant
O5	Processes and management			
O5.1	The licensee must take all practicable steps to control entry to the premises.	LEMP Site inspection Daily Inspection Checklist	The site security process of the site is defined in LEMP. The landfill site is bounded by security fence along the perimeter of the site. The main access gate has alarm and is locked outside business hours. The main access to the landfill area is through weigh bridge which has camera installed and alarm. A sample of daily inspection checklist was provided as evidence for includes inspection of gates and fencing for damage and illegal entry at leachate ponds; ammonia plant; settling ponds and weighbridge.	Compliant
O5.2	The licensee must ensure that all gates are locked whenever the premises is unattended.	LEMP Appendix H End of day closure and security procedure.	The end of day closure and security procedure is defined in LEMP. Gates are locked outside business hours as witness during site audit.	Compliant
O6	Waste management			
O6.1	The licensee must have in place and implement procedures to identify and prevent the disposal of any waste not permitted by this licence to be disposed of at the premises.	LEMP Section 5.0 Example rejected loads report Sep 2016 - Sep 2017	The LEMP Section 5 defined the gatehouse operations that included the following: • Waste screening • Waste measurement and recording • Recycling • Trye management	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
			• Waste transfer station • Cleaning of vehicles. However, the full implementation of each procedure were not assessed during this audit. Record of example rejected loads report from Sep 2016 - Sep 2017 were presented as evidence to this condition that the landfill only accepts waste that are specified within the license. E.g. rejection of construction waste, soil, builders waste, green waste, plaster etc. Further discussion is provided for Condition 4; Schedule 4 of the MCoA.	
O6.2	The licensee must ensure that the local amenity is not degraded by litter from the premises.	LEMP 9.3 Litter Control Extract from Trim (records management system) Community Service Attendance Records - Litter collection SOP - Wind blown litter collection – Whytes Gully	The LEMP defined the process for litter control. Generation of litter is primarily through wind at the tipping face. Litter fences are located at the perimeter of the landfill around northern, eastern and western sides of the active filling area. WCC reported that litter patrols operate on a weekly basis, however, significant amounts of litter were observed on the litter fences and in areas on site. Evidence of attendance of litter collection was provided. Access was not available to areas adjacent the site outside the site boundary, hence the extent of litter impacts outside of the site were not assessed. Litter was not observed at the entrances to the site. See discussion at Condition 9, Schedule 4 of the MCoA. During the site inspection significant quantities of litter was observed on site, generally caught in obstructions such as shrubs, trees and fences. Off site areas were not accessible to inspect. Minutes of the 2017 Whytes Gully reference group (22 November 2017) indicated that residents advised “that there is a lot of rubbish around, In particular in Reddalls Road, from the corner of the tip to the car yard. One member also mentioned that the area near where he lives there are plastic bags up in the trees.” On the basis of site observations during both site inspections, and the feedback from community representatives at the November Whytes Gully reference group, that WCC are not compliant with this condition and that there is significant opportunity to reduce the amount and extent of litter at the site (and off site) through better controls or through more frequent litter reduction campaigns. While litter was sighted on site and by residents off site (as discussed above), it was not determined this was to the extent to degrade the local amenity. The recommendations as stated at Condition 9, Schedule 4 of the MCoA apply.	Compliant See recommendations as stated at Condition 9, Schedule 4 of the MCoA.
O6.3	The licensee must only dispose of waste in the Upper Eastern Gully Tipping Face, Cell 1A or Cell 1B.	LEMP Annual Returns	The tipping face area is defined in the LEMP Section 6.3 Filling plan /contours. The tipping area was observed to be within Upper Eastern Gully Tipping Face, Cell 1A or Cell 1B as shown in the photo below.	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
				
O6.4	The surface of filled areas must have a minimum slope of one per cent with suitable design to prevent ponding of water. Any surface depressions that develop must be restored, graded and compacted to prevent further ponding of water.	Site Inspection SOP Placement & Compaction of waste	Based on the site inspection, there was no ponding water on the tip face. The tip face was compacted, regraded and temporary covered. A standard operating procedure was also developed for the placement and compaction of waste. It was noted in this SOP that a slope of 4:1 is maintained on the working face.	Compliant
				
O6.5	The licensee must apply cover material to landfilled waste in accordance with this condition. This cover material must be either Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM – as defined and characterised by the Excavated Natural Material Order, as in force from time to time), Road Asphalt Profiling's (RAP), Steel Furnace Slag (SFS), Steel Framed Fabric or Metal Covered Landfill Lids or an alternative cover approved in writing by the EPA. a) Daily cover must be applied to a minimum depth of 150mm over all exposed landfilled waste prior to ceasing operations at the end of each day. b) Intermediate cover must be applied to a depth of 300mm over surfaces of the landfilled waste at the premises which are to be exposed for more than 90 days. c) Cover material stockpile: at least two weeks cover material must be available at the premises under all weather conditions. This material may be won on site, or	LEMP Covering of Waste SOP Placement & Compaction of waste EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017 Acceptance of VENM at Landfill Whytes Gully tonnage data - waste and recycling Annual Return Report SOP Placement & Compaction of	The procedure for covering the landfill is defined in the LEMP. The SOP for Placement and Compaction of waste was developed and included the covering requirement of the landfill waste with daily cover of approximately 150 mm. WCC also reported use of steel plates or lids to be placed as cover overnight. Stockpile of cover material was stored onsite and these materials have been tested and classified as VENM. An example of certification of VENM materials and soil classification records were provided as evidence for this requirement. Records provided by WCC as sample of compliance to this condition were: • IW - Major Projects - Environment - Fowl~for the Acceptance	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
	alternatively a cover stockpile may be maintained adjacent to the tip face. d) Excavated Natural Material used as cover material must be managed in accordance with the practices detailed in the licensee's letter dated 21 March 2017 (Z17/70390).	waste	and Disposal. • IW - Major Projects - Environment - Fowl~fication Virgin Excavated Natural Material • IW - Major Projects - Environment - Fowl~VENM at WWRRP - Soil Classification for Stage 1A.	
O6.6	The licensee must ensure that landfill cells are capped progressively during operations and specifically at times when the level of waste reaches final heights	LEMP Covering of Waste SOP Placement & Compaction of waste EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017 Acceptance of VENM at Landfill Whytes Gully tonnage data - waste and recycling Annual Return Report	The landfill operations had not reached a point where they could be capped at the time of the site inspections for the audit. The process for covering the landfill is defined in LEMP as per the condition. The filled cells are temporarily covered. The tip face is covered during daily operations. The capping layers will be constructed once the final height of the cell has been reached. The following procedure and records were provided as evidence of compliance to this condition: • SOP Placement & Compaction of waste • EPL 5862 WHYTES GULLY Volumetric survey - June 2017 - Email 21 July 2017 • Acceptance of VENM at Landfill • Whytes Gully tonnage data - waste and recycling • Annual Return 2016-2017 	Compliant
O6.7	Vehicles leaving the premises must not track materials to external surfaces.	LEMP Section 5.6	The process for cleaning vehicles before leaving site is defined in LEMP Section 5.6. The tipping face access road and all access roads are sealed with bitumen or gravel which limits the tracking of mud or dirt to external surfaces. A wet weather tipping area covered with gravel is used during inclement weather to limit exposure of vehicles to mud. A water cart was also permanently available onsite for dust suppression	Compliant

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			and also used for cleaning mud. A high-pressure water cleaner is also available to clean vehicles prior leaving site. There were no signs of tracking of mud or dirt on the road to external surfaces during the audit inspection. 	
O6.8	The licensee must not exhume any landfilled waste unless approved in writing by the EPA.	Removal of Rainflap on Cell 1B – Excavation and Exhuming Waste	The process of exhumation of the landfill is defined in the LEMP. Two-2 Penalty Notices (1521880 and 1521881) were raised on 22 May 2014 regarding exhumation of waste: o O6.4 -Non-compliance with Condition O6.4 - The licensee must not exhume any landfilled waste unless approved in writing by the EPA. Penalty Notice issued. WCC consider this to be an historic incident for which Council has implemented amended controls to eliminate recurrence. Controls implemented are performing as designed. WCC has not exhumed any landfilled waste unless approved in writing by the EPA since this event in 2014. An approval for exhumation of waste for the removal of rainflap was granted in October 2017. Given the events in 2014, WCC were not compliant with this condition at this time. Since May 2014 it is considered that WCC has been compliant with the condition hence no recommendation is made.	**Non-compliant**
O6.9	The licensee must obtain approval from the EPA prior to constructing any landfill cells at the premises.		The EPL has had several variations applied to it in recent years. Approvals prior to construction of any landfill cells or facilities are defined in the licence such as the following: • Removal of requirement to monitor redundant or removed environment monitoring points MP2, MP6, MP7 & MP8 on 22 June 2017. • Approval to construct Package 2 & 3 Landfill Cells/Deep Leachate Drainage System 20 January 2017. • Approval granted to construct and operate the new contingency leachate pond 23 November 2016. • Approval to reinstate cover material descriptions and allow specific material types. • Additional conditions regarding the management of onsite sediment basin/s at the premises. • Streamline, add and update waste management conditions 14 October 2016. • Approval granted to dispose of waste in Cell 1B on 01 September 2015	Compliant

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			• Approval granted to dispose of waste in Cell 1A on 28 October 2014. • Site boundaries updated to excise the previous Solid Waste to Energy Recovery Facility from the landfill licence to allow Visy to gain their own licence for the retrofit of the building as a Materials Recovery Facility. Also, addition of a Potential Offensive Odour clause and analytical unit measures amended on 08 July 2014. • Wording amendments and consolidation of various clauses as well as monitoring point updates in 23 August 2013.	
O6.10	The licensee must provide a report to the EPA which details the design, construction, operation and rehabilitation of any new landfill cell. This report must be submitted to the EPA at least six months before the licensee intends to construct the cell, and it must include details on a QA/QC program which can demonstrate that the cell was constructed to meet its design specifications.	1528284-086-R-Rev0 CQA Plan for Package 2 and 3 117625003-317-R-Rev0 - Whytes Gully P1A Completion Report 117625003-317-R-Rev0 - Whytes Gully P1A Completion Report	The Completion reports for Package 1, 2 and 3 were provided to the auditors. These completion report included design, construction, operation and rehabilitation of any new landfill cell as well as the QAQC report. Letters of submission to EPA were also provided as evidence.	Compliant
O6.11	The licensee is permitted to construct the Package 2 and Package 3 Landfill Cells in accordance with the following documents, drawings and requirements: a) "Preliminary Design Report", Golder Associates, April 2012; b) "Whytes Gully Resource Recovery Park - Detailed Design Report Tender Packages 1, 2 and 3", Golder Associates, June 2013; and c) "Whytes Gully Landfill Detailed Design Report Update - Tender Package 2 and 3 Landfill Cells", Golder Associates, October 2016. The most recent document, drawing and requirement supersedes any conflict between older documentation, drawings and requirements.	1528284-086-R-Rev0 CQA Plan for Package 2 and 3	Ongoing construction of Package 2 and 3 Landfill Cells was observed during the site inspections for this audit.	Compliant
O6.12	Prior to disposing of any waste in the Package 2 and Package 3 Landfill Cells, the licensee must submit to the EPA a Construction Quality Assurance (CQA) Report providing work as-executed documentation and the results of the implementation of the CQA Plan detailed in the "Construction Quality Assurance Plan Package 2 and 3 Landfill Cells", Golder Associates, 20 December 2016 and Appendix B of the "Whytes Gully Landfill Detailed Design Report Update - Tender Package 2 and 3 Landfill Cells", Golder Associates, 5 October 2016.		Not yet applicable at this stage. Cells were being constructed and no wastes were placed in these cells at the time of audit.	Noted
O6.13	The licensee is permitted to construct the Deep Leachate Drainage System in accordance with the following documents, drawings and requirements: a) "Henry & Hymas Detailed Design Report - Project Name: Western Gully Deep Leachate Drainage System - Whytes Gully Landfill", H&H Consulting Engineers Pty Ltd, December 2016.	WWARRP Western Gully Deep Leachate Drainage Works Completion Report	Ongoing construction of the Deep Leachate Drainage System was occurring at the time of audit.	Noted
O6.14	Within 1 month of the completion of construction of the new Deep Leachate Drainage System permitted by condition O6.13, the licensee must provide the EPA with a copy of a QA/QC report detailed in Section 6 of the document "Henry & Hymas Detailed Design Report - Project Name: Western Gully Deep Leachate Drainage System - Whytes Gully Landfill", H&H Consulting Engineers Pty Ltd, December 2016	WWARRP Western Gully Deep Leachate Drainage Works Completion Report	Ongoing construction of the Deep Leachate Drainage System was occurring at the time of audit. As it was not completed, the condition had not been triggered.	Not Triggered

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No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
O6.15	The licensee is permitted to construct the New Leachate Pond in accordance with the following documents, drawings and requirements: a) "Design Report - Whytes Gully Landfill - New Leachate Pond", Golder Associates Ptd Ltd, July 2016; and b) "Technical Specifications - Whytes Gully Landfill - New Leachate Pond", Golder Associates Pty Ltd, July 2016. The most recent document, drawing or requirement supersedes any conflict between older documentation, drawings and requirements		Ongoing construction of the New Leachate Pond was occurring at the time of audit. The Completion Report for the New Leachate Pond was still to be prepared and submitted to the EPA.	Not Triggered
O6.16	Within 1 month of the completion of construction of the new leachate pond permitted by condition O6.15, the licensee must provide the EPA with a copy of a QA/QC report detailed in Section 3.15 of the document "Technical Specifications, Whytes Gully Landfill, New Leachate Pond", Golder Associates Pty Ltd, July 2016		Ongoing construction of the New Leachate Pond was occurring at the time of audit. As it was not completed, the condition had not been triggered.	Not Triggered
O6.17	The last licensee must prepare and submit to the EPA within six months prior to the last load of waste being landfilled, a closure plan in accordance with section 76 of the Protection of the Environment Operations Act 1997.		Not yet applicable at this stage.	Not Triggered
O7	Other operating conditions			
O7.1	Drainage from areas not subject to waste disposal activities must be directed away from the existing leachate collection pond(s).		Drainage from areas not subject to waste disposal activities were directed away from the leachate ponds and to the sediment pond. Drainage or swale were lined with gravel.  A Rainflap was also used to redirect surface water away from active landfill areas. 	Compliant

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No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
O7.2	The licensee must maintain a leachate management system to collect and direct all leachate to a point for treatment and disposal to sewer.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data	The leachate management system is being operated and evidence of monitoring and testing of leachate were provided to the auditors. Leachate ponds were sighted in operation during the audit sites inspections. The Leachate Treatment Plant is connected to the leachate pond and treated water is tested prior to discharge to sewer within the Trade Waste agreement and EPL requirements. It is noted that the maintenance records of the leachate pond was not covered during this audit. The compliance assessment was based purely on the leachate monitoring results and trade waste effluent results that demonstrate the treatment of the leachate prior to disposal to sewer as per the requirements of Sydney Water Trade Waste Agreement 11205. The auditors have not assessed compliance with the Trade Waste Agreement. 	Compliant
O7.3	Disturbed areas must be provided with separate water quality controls for the treatment of runoff containing suspended or turbid pollutants.	Site controls Whytes Gully Inspection November 2017	During the audit inspections, it was observed that generally disturbed areas within the operation facilities were spray grassed or covered with geofabric. Swales or drainage were generally lined with gravel, and sand bags or check dams were also place within the swales. However, limited erosion and sedimentation controls were noted within the construction areas of cells 2 and 3 and at the newly constructed leachate pond (see photos below). The lack of controls in these areas was reported by WCC to have been from recent construction activities conducted in and adjacent to the drainage line. Issues on this area were also noted in the Whytes Gully Inspection November 2017 Report prepared by the WCC surveillance officer from the public works division. Photo below was taken at the outlet of stormwater swale from the construction of Cell 2 & 3. Note that there was no sediment control prior to the entry to the culvert.	**Non-compliant**

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			 Photo below was taken at the new leachate pond noting the scouring along the toe of the embankment.  WCC noted that since the site inspection, it has and continues to address these issues with the construction contractor on the site. A stop work order was issued in October 2017 and rectification implemented before work could recommence. Performance management of the contractor is ongoing. **Recommendation: That WCC and its contractors review the processes for installation of ERSED controls in construction areas and ensure that controls are effective and placed promptly after**	

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No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
			works are completed.	
5 Monitoring and Recording Conditions				
M1 Monitoring records				
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	Results of all monitoring required were presented in the MONITORING LANDFILL SITES MASTER Whytes Gully analytical data register. Monitoring Reports are posted on the council website. Whytes Gully Groundwater Monitoring – is conducted quarterly in February, May, August and November, and annually in August. Whytes Gully Stage 3 Bores & Surface Water Monitoring – is conducted quarterly in February, May, August and November Whytes Gully Surface Water Monitoring – is conducted annually in August, and after any overflow event caused by rain Whytes Gully Air Monitoring – is conducted monthly.	Compliant
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data	Records were kept by WCC as per this requirement and posted in the WCC website. Monitoring reports posted in the website were from 2012 up to the latest month results.	Compliant
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	All required Monitoring Reports are posted in council website. The monitoring reports included the following records: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample	Compliant
M2 Requirement to monitor concentration of pollutants discharged				
M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	Monitoring requirements, sampling locations and analytical test results were presented and maintained in MONITORING LANDFILL SITES MASTER Whytes Gully analytical data as well as on the WCC website. Whytes Gully Stage 3 Bores & Surface Water Monitoring – is conducted quarterly in February, May, August and November Whytes Gully Surface Water Monitoring – is conducted annually in August, and after any overflow event caused by rain.	Compliant
M2.2	Air Monitoring Requirements		Landfill gas monitoring is conducted monthly as reported in the MONITORING LANDFILL SITES MASTER Whytes Gully analytical data.	
M2.3	Water and/ or Land Monitoring Requirements			
M3 Testing methods - concentration limits				

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No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
M3.1	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted. Note: The Protection of the Environment Operations (Clean Air) Regulation 2010 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	Monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area was conducted in accordance with the Approved Methods Publication, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW. The register MONITORING LANDFILL SITES MASTER Whytes Gully analytical data include method of testing. Laboratory results posted in the website included the approved method of testing used for analysis of samples.	Compliant
M3.2	Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.	MONITORING LANDFILL SITES MASTER Whytes Gully analytical data http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	The monitoring for the concentration of pollutant emitted to the air is done in accordance with the Environmental Guidelines Solid Waste landfills 2016 or z15/32402 for remedial actions and EPA reporting requirements.	
M4	Recording of pollution complaints			
M4.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Council Record System – TRIM Annual Return 2016-2017	Extract from Pathways (one of records management system) - Air Pollution Complaints for Whytes Gully. Waste Operations Manager noted that all complaints/ correspondence lodged with Council or via EPA are logged in Pathway and/or TRIM.	Complaint
M4.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	LEMP Section 4.3 Complaint Register Annual Returns Environmental Incident Reports for complaints received on 24 November 2016; 6 March 2017; and 17 March 2017. http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx. Councils Customer Request Management System 'Pathways'	The process of recording complaints is defined in the LEMP. Records are kept in the Council system TRIM. WCC reported that complaints are logged into Councils Customer Request Management System 'Pathways'. Summaries of complaints data are reported to the community via the EPA Annual Returns which are published on WCC website. The EPA receive investigation reports. Auditors were provided with Environmental Incident Reports for complaints received on 24 November 2016; 6 March 2017; and 17 March 2017. These detailed a description of the complaint(s) for 6 complaints; time of the complaint(s); weather at time of the complaint and other incident details. Further, Annual Reports and Annual Returns to EPA provide a summary of the complaints received for the period. WCC did not provide to auditors the detailed complaint data for each complaint, hence auditors were unable to verify that an Environmental Incident Report is completed for all complaints.	Compliant
M4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Council Record System – TRIM Councils Customer Request	Records are available when requested and go back at least four years. All complaints are logged into Councils Customer Request Management System 'Pathways'. Complaints are reported to the	Compliant

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		Management System 'Pathways'	community via the annual returns which are published on WCC website. The EPA receive investigation reports	
M4.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	WCC reported that records are made available if and when requested by the EPA.	Compliant
M5 Telephone complaints line				
M5.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	LEMP Section 4.3	Council's main customer service line is 4227 7111. This number is widely advertised and calls to this number are promptly allocated to the responsible personnel.	Compliant
M5.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	LEMP Section 4.3	WCC stated that when entering "Wollongong City Council Complaint" into a search engine, the user is directed to a 'Contact Council' web page which provides a variety of ways to contact Council including after hours. This was verified and does include a link to make pollution complaints. However, when following the website links to make a complaint, there is no category for the Whytes Gully Landfill; and if you follow the links for a large industrial facility with an Environmental Protection Licence, you are directed to the EPA. WCC also noted that signage is in place with emergency contact numbers on the site's front gate. However, the signage at the front of the landfill or at the weighbridge did not specifically identify a complaints number and what to do in the event of wanting to make a complaint. **OFI: It is recommended that WCC review the on line complaints process on the WCC website to specifically include a means of making a complaint for Whytes Gully direct to WCC, rather than the EPA.** **OFI: It is recommended that WCC improve signage at the site to better advertise the complaints line telephone number so that the impacted community knows how to make a complaint.**	Compliant
M5.3	The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.			Noted
M6 Other monitoring and recording conditions				
M6.1	The licensee must maintain a record of all events involving the removal of any waste that was brought to the facility and which is not permitted to be disposed of at the facility.	22. Whytes Gully tonnage data - waste and recycling Example rejected loads report Sep 2016 - Sep 2017	Records of waste received at the recycling area and wastes that were disposed offsite are recorded in the register Whytes Gully tonnage data - waste and recycling.	Compliant
M6.2	The licensee must make available to the EPA the results of monthly Trade Waste monitoring of leachate and include these results in the Annual Report.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	The Annual Reports are publicly available and searchable on the WCC website and on the EPA website. The Annual Report 2016-2017 was available in the WCC website and the EPA website. This also included reporting of leachate monitoring.	Compliant
6 Reporting Conditions				

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No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
R1 Annual return documents				
R1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: 1. a Statement of Compliance, 2. a Monitoring and Complaints Summary, 3. a Statement of Compliance - Licence Conditions, 4. a Statement of Compliance - Load based Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices. At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017 http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx.	The annual return for 2016-2017 was completed and provided to EPA comprising the approved form and required content as per this condition.	Compliant
R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below. Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	The annual return was completed with respect of each reporting period.	Compliant
R1.3	Where this licence is transferred from the licensee to a new licensee: a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period. Note: An application to transfer a licence must be made in the approved form for this purpose.	http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx.	WCC reported that the licence has not been transferred during the audit period.	Not Triggered
R1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.		WCC reported that the licence has not been surrendered or revoked during the audit period.	Not Triggered
R1.5	The Annual Return for the reporting period must be supplied to the EPA via eConnect EPA or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	The annual return was supplied to EPA in July 2017 not later than 60 days from the time of licence anniversary date which 29 May.	Compliant
R1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	Whytes Gully Waste Disposal Facility Annual Report Period 01 June 2012 – 31 May 2013 Reference Z13/131625	The annual returns since 1999 were recorded in EPA website. WCC also kept the annual returns and searchable in the WCC website. Annual Return 2012 -2013 which was 4 years old was still saved in WCC website and available to the public.	Compliant

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No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
R1.7	Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017	Statement of Compliance was certified and monitoring and complaints summary was signed in the Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017. The statement of compliance is signed by the General Manager (David Farmer) on 27/07/17.	Compliant
R1.8	The Annual Return must be accompanied by/or include an Annual Report which must contain an assessment of environmental performance relevant to licence conditions including: a) tabulated results of all monitoring data required to be collected by this licence; b) a graphical presentation of data from at least the last three years (if available) in order to show variability and/or trends. Any statistically significant variations or anomalies should be highlighted and explained; c) an analysis and interpretation of all monitoring data; d) an analysis of and response to any complaints received; e) identification of any deficiencies in environmental performance identified by the monitoring data, trends or incidents and of remedial action taken or proposed to be taken to address these deficiencies; and f) recommendations on improving the environmental performance of the facility.	Whytes Gully WWARRP - Annual Return 29 May 2016 - 28 May 2017 http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx.	The Annual Returns sighted for the audit period included an assessment of environmental performance and generally addressed the sub-conditions a to f. The 2013-2014 Annual Return indicated that two penalty notices were issued. Auditors did not sight these penalty notices. It is not clear as to which EPL conditions they the Penalty Notices related. The Annual Return stated: *"Both penalty notices issued were associated with processes that Council did not undertake in accordance with the Whytes Gully Environment Protection Licence conditions. The first penalty notice was associated with excavating into waste to dispose of large flood related debris. Any waste excavation requires EPA preapproval.* *The second penalty notice was associated with a major construction contractor not complying with the defined approved odour management plan for the works undertaken. Specifically, the maximum trench distance for the installation of a gas drainage pipe was exceeded. Both of these circumstances have been identified by the EPA as generating odour."* An Official Caution was received by WCC from the EPA for failing to identify the 2013-14 Penalty Notice within the Statement of Compliance section of 2013-2014 Annual Return. On the basis of these events WCC are considered non compliant with this condition for the relevant period. Since this period WCC has been compliant with the condition. There is no corresponding recommendation for this non compliance.	Non Compliant (for 2013 – 2014 Report only)
R2 Notification of environmental harm				
R2.1	Notifications must be made by telephoning the Environment Line service on 131 555. Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.	LEMP Section 11 http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	The process of reporting incidents and environmental harm to EPA is defined in the LEMP Section 11. All incidents are recorded in the Annual Returns for the site and these are kept on Councils publicly accessible website.	Compliant
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.	LEMP Section 11 http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx MONITORING LANDFILL SITES MASTER Whytes Gully analytical data	The process of reporting incidents and environmental harm to EPA is defined in the LEMP Section 11. Records of not notifiable incidents were recorded in VAULT which is a WHS records management system. All incidents are recorded in the Annual Returns for the site and these are kept on Councils publicly accessible website. As per the waste operations manager all incidents are notified to EPA through calls within 24 hours then followed up by the incident report within 7 days. The assessment of compliance this condition is based on	Compliant

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No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
			the waste operations manager confirmation and environmental incident register that included date of incident date reported to EPA. Individual incident reports were not provided to the auditors.	
R2.3	The licensee must notify the EPA within 24 hours in accordance with condition R2.1 if surface monitoring detects methane above 1.25% (v/v), and increase the frequency of monitoring to daily, until the EPA determines otherwise.	LEMP Section 11 http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx IW - Project Management - Safety and Environmental - 13853 - 170922 - INC07 - Damaged Pipe MONITORING LANDFILL SITES MASTER Whytes Gully analytical data IW - Project Management - Safety and Environmental - 13853 - 170922 - INC07 - Damaged Pip	The process in reporting incidents and environmental harm to EPA is defined in the LEMP Section 11. Environmental incidents are recorded in the Annual Returns for the site and these are kept on Councils publicly accessible website. One example of construction incident report was provided to auditors relating to damage to a leachate pipe resulting in a leak of leachate. Investigation of the incident was conducted, and an incident report was provided to the EPA. As stated by the waste Operations Manager, all incidents are notified to EPA through calls within 24 hours then followed up by the incident report within 7 days. The assessment of compliance this condition is based on the waste operations manager confirmation and environmental incident register that included date of incident date reported to EPA. Individual incident reports were not provided to the auditors.	Compliant
R3 Written report				
R3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: a) where this licence applies to premises, an event has occurred at the premises; or b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event	LEMP Section 11 http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	There were two-2 Penalty Notices 1521880 and 1521881 both raised on 22 May 2014 from the EPA: • O6.4 -Non-compliance with Condition O6.4 - The licensee must not exhume any landfilled waste unless approved in writing by the EPA. Penalty Notice issued Other than these notices, WCC did not report that an EPA Officer had made requests relevant under this condition.	Not Triggered
R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.		As indicated above, WCC did not report that an EPA Officer had made requests relevant under this condition or R3.2.	Not Triggered
R3.3	The request may require a report which includes any or all of the following information: a) the cause, time and duration of the event; b) the type, volume and concentration of every pollutant discharged as a result of the event; c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and g) any other relevant matters.		As indicated above, WCC did not report that an EPA Officer had made requests relevant under this condition or R3.1.	Not Triggered

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.	LEMP Section 11 http://www.wollongong.nsw.gov.au/services/household/Pages/wastesitesanalyticalmonitoringdata.aspx	As indicated above, WCC did not report that an EPA Officer had made requests relevant under this condition or R3.1.	Not Triggered
	R4 Other reporting conditions			
R4.1	The licensee must maintain a daily log and record the following data of fires at the site: a) Time and date when the fire was deliberately started or reported. b) Whether the fire was authorised by the licensee, and, if not, the circumstances which ignited the fire. c) The time and date that the fire ceased and whether it burnt out or was extinguished. d) The location of fire (eg. clean timber stockpile, putrescible garbage cell, etc). e) Prevailing weather conditions. f) Observations made in regard to smoke direction and dispersion. g) The amount of waste that was combusted by the fire. h) Action taken to extinguish the fire.	VAULT extract (WHS records management system) Whytes Gully 2013 to 2017	Two fires were recorded in the WHS records management system. Register of events were provided for WGRRP from 2013 to 2017. The fires occurred on 31-7-2013 and 21-8-2013. The system did not report fires after this event. The system indicated that the first fire was reported to the EPA, and a separate email indicated that the second fire was also reported to the EPA. The data provided to auditors did not address all of the requirements of the conditions a to h. As such, Auditors were not able to verify compliance with this condition. **Recommendation: It is recommended that WCC record all details as defined in the condition relating to fires at the site and ensure that the EPA are notified of details of fires occurring on site as defined in the condition.**	**Not Verified**
R4.2	The licensee or its employees or agents must notify the EPA in accordance with conditions R2.1 and R2.2 of all fires at the premises as soon as practical after becoming aware of the incident.	VAULT extract (WHS records management system) Whytes Gully 2013 to 2017	See response to above condition R4.1.	**Not Verified**
	7 General Conditions			
	G1 Copy of licence kept at the premises or plant			
G1.1	A copy of this licence must be kept at the premises to which the licence applies.	EPL 5862	The copy of the license is available at the premise.	Compliant
G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.		The copy of the licence is available to any authorised officer of EPA who asks to see it.	Compliant
G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.		The copy of the license is available on the WCC and the EPA website and is searchable and available to all employees and public.	Compliant
	8 Special Conditions			
	E1 Environmental Obligations of Licensee (Works & Programs)			
E1.1	While the licensee's premises are being used for the purpose to which the licence relates, the licensee must: a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents. b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA. c) Provide all monitoring data as required by the conditions of this licence or as directed	LEMP and CEMPF Placement and Handling of Special Waste - Whytes Gully Waste Services Example rejected loads report Sep 2016 - Sep 2017	The process for managing spill and clean up of any leaks is defined in the LEMP and CEMPF. An SOP for Placement and Handling of Special Waste - Whytes Gully Waste Services was developed and implemented. As reported in the Rejected Loads report from Sep 2016 to Sep 2017, wastes that are not acceptable at the landfill gets rejected and sent offsite. Reference is made to the relevant conditions of the MCoA and	Compliant

Whytes Gully Landfill Extension Project Environmental Protection License (5862)				
No.	**Condition**	**Evidence Source**	**Comment / Finding**	**Compliance Status & Recommendation**
	by the EPA.		responses to these conditions.	
E1.2	In the event of an earthquake, storm, fire, flood, or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purposes to which the licence relates) must: a) make all efforts to contain all firewater on the licensee's premises, b) make all efforts to control air pollution from the licensee's premises, c) make all efforts to contain any discharge, spill or run-off from the licensee's premises, d) make all efforts to prevent flood water entering the licensee's premises, e) remediate and rehabilitate any exposed areas of soil and/or waste, f) lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of, g) at the request of the EPA monitor groundwater beneath the licensee's premises and its potential to migrate from the licensee's premises, h) at the request of the EPA monitor surface water leaving the licensee's premises; and i) ensure the licensee's premises is secure.	Flood Emergency and Evacuation Plan	The Flood Emergency and Evacuation Plan was developed to manage some of these emergency events. No pollution events as described in the condition were reported to have occurred by WCC during the audit period.	Not Triggered
E1.3	After the licensee's premises cease to be used for the purpose to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must: a) remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and b) rehabilitate the site, including conducting an assessment of and if required remediation of any site contamination.	LEMP Section 10 Site Closure	The process for site closure and rehabilitation of the site is defined in LEMP Section 10.	Not Triggered

Appendix C
Audit Team DP&E Approval

NSW GOVERNMENT | Planning & Environment

Contact: Mr Kelly McNicol
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Whytes Gully Landfill Extension Project (11_0094)
Auditor Endorsement - Independent Environment Audit 2017

Dear Ms McMahon,

I refer to your email correspondence dated 27 July 2017 seeking approval for MCW Environmental Consulting Pty Ltd (MCW) to undertake the Independent Environmental Audit (IEA) for the Whytes Gully Landfill Extension Project, as required under Condition 9 of Schedule 5 of the project approval (11_0094). The Department understands that a team consisting of Mr Michael Woolley, Ms Annabelle Tungol Reyes and Ms Alice Pryke of MCW is proposed to undertake the audit.

Having reviewed the audit team's CVs submitted with your correspondence, the Department is satisfied with the audit team's suitability to conduct the audit. This approval is conditional upon the audit team's independence from the project.

In preparing the IEA, the audit team must ensure the audit:

- is conducted in accordance with AS/NZS ISO 19011:2003 *Australian/New Zealand Standard: Guidelines for quality and/or environmental management systems auditing*;
- includes a compliance table indicating the compliance status of each condition of consent (and any other statutory instrument required to be audited);
- avoids terms such as "partial compliance". An audit is to make findings of either "compliance", "non-compliance" or "inability to be determined";
- includes recommended actions in response to non-compliances; and
- identifies opportunities for improved environmental management and performance.

Please ensure that the audit team is advised of these requirements. The Department also requests that you submit an action plan with the audit report(s) detailing your response to the auditor's recommendations and timeframes to implement any adopted recommendations.

Should you have any enquiries, please contact Mr Kelly McNicol on the above details.

Yours sincerely

Chris Ritchie 2/8/17
Director
Industry Assessments
As the Secretary's nominee

Table 8-1 - Non-Compliant and Not Verified Conditions – MCoA 11_0094 and Statement of Commitments

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation	Actions
Sch 3 Condition 7	Within 12 months from the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall surrender the development consents identified in Table 1 in accordance with Section 75YA and 104A of the EP&A Act	At the time of the audit site inspections. WCC could not demonsrate that they had surrendered the previous development consents. On 29 March 2018, WCC provided documents showing that WCC surrendered all of the leases detailed in Table 1 on the leases on 13 March 2018, except for DA 1996/8256 and DA-1996/6256. The surrender of leases followed an application to surrender the leases dated 7 February 2018. On the basis that the Development Consents were not surrendered within 12 months of the date of the Approval (being 3 April 2013); and that surrender of two development consents may be oustanding; WCC is considered non-compliant with this condition.	Non-Compliant **Recommendation**: Ensure that development consents DA 1996/8256 and DA-1996/6256 are surrendered in accordance with Condition 7: Schedule 3.	All of the relevant DA consents have been surrendered by the 27th March 2018.
Sch 4 Condition 9	The Proponent shall: a) implement suitable measures to prevent the unnecessary proliferation of litter both on and off-site, including the installation and maintenance of a mesh fence of not less than 1.8 metres high around the site; and b) inspect daily and clear the site (and if necessary, surrounding area) of litter on at least a weekly basis.	Fencing was installed around the boundary of the landfill. Cleaning of litter around the perimeter was reported to be conducted by WCC on a campaign basis at least weekly. WCC reported that daily inspections are carried out that includes litter inspections. A template form including the item "workplace free of litter and obstructions" was sighted.	Non-compliant	Council conducts most of the litter removal at the site via intensive campaigns at least weekly. There is a dedicated crew on site at least once a week performing litter reduction. This non compliance is based on technical wording associated with "clear the site of litter". The auditor has advised that even one piece of litter under this wording renders Council non-compliant. Council does not agree with this interpretation and feels that if the intent was that no single piece of litter should be identified at an time on site, than the consent wording would be that specific.
		During the site inspection significant quantities of litter was observed across the site, generally caught in obstructions such as shrubs, trees and fences and also in and around landfill areas. Off site areas were not accessible to inspect.	**Recommendation**: Increase the effectiveness of litter reduction controls and of litter reduction campaigns to reduce on and off site litter.	Agreed: Council are looking at ways to safely capture of the windblown litter with new designed litter fences and also additional litter reduction staff.
		Minutes of the 2017 Whytes Gully reference group (22 November 2017) indicated that residents advised *"that there is a lot of rubbish around, In particular in Reddalls Road, from the corner of the tip to the car yard. One member also mentioned that the area near where he lives there are plastic bags up in the trees."* On the basis of site observations during both site inspections, and the feedback from community representatives at the November Whytes Gully reference group, that WCC are not compliant with this condition and that there is significant opportunity to reduce the amount and extent of litter at the site (and off site) through better controls or through more frequent litter reduction campaigns.	OFI: Reconsider with DPE what would be acceptable in terms of "clear the site of litter" so as to be able to comply with this condition	
		It is noted that the condition requirement to *"clear the site"* of litter is very challenging given the extent of plastic bags etc. disposed of at the landfill on a daily basis		Agreed: Council will seek an opportunity to discuss calrification of this description.
Sch 4 Condition 14	The Proponent shall ensure that all licensed surface water discharges from the site comply with the discharge limits (volume and quality) set for the project in any EPL or relevant provisions of the POEO Act	As noted in the annual report 2016-2017, surface water that exited the site in June 2016 and July 2016 contained suspended solids at levels above the 50mg/L concentration limit prescribed in the sites Environment Protection Licence.	Non-compliant	This non compliance has been reported to the EPA and additional processes and procedures have been placed around the sites storm water management and reviewed after each event.
		Downstream samples taken at the same time indicated suspended solids <50mg/L concentration limit and it was reported by WCC that there was no material harm caused by the non-compliance (as defined by Section 147 of the POEO Act 1997).	**Recommendation:** Continue to review the effectiveness of corrective actions applied to site water management and address any further non compliances as required	This non-compliance is a replication of a historic EPL non compliance and has since been managed to the satisfaction of the EPA.
		To help reduce the likelihood of future non-compliances, a Wet Weather and Stormwater Management work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events.		This condition is a replication of EPL conditions.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation	Actions
		Since the implementation of the new work instruction, no further sediment rich discharges have occurred. Council consider that these are historic results and that Council has implemented amended controls to eliminate recurrence, noting that controls implemented are performing as designed. Though the above situation has been reported by WCC through the EPL Annual Report for 2016-2017, the exceedance of suspended solids above the discharge limit is noted as non-compliant to this condition.		
Sch 4 Condition 18e	The Proponent shall prepare and implement a Soil, Water and Leachate Management Plan for the project in consultation with Council, NOW and the EPA and to the satisfaction of the Director-General. This plan must be prepared and implemented by a suitably qualified and experienced person and be approved by the Director-General prior to the commencement of operation. The plan must include: e) an on-going surface water, groundwater and leachate monitoring program that includes (but is not limited to): a commitment to provide the results of monitoring to NOW and other relevant government agencies every 12 months	WCC did not provide evidence that results of monitoring are reported to NOW and other relevant government agencies every 12 months, hence compliance with this aspect of the condition was not Verified	Not Verified Recommendation: Provide results of monitoring to Crown Lands and Water (formerly NOW) and other relevant government agencies every 12 months as required of the condition.	Council would like discuss with DoP what Governement agencies would like data from the site as well as what data they would require.
Sch 4 Condition 23	The Proponent shall ensure the project does not cause or permit the emission of any offensive odour (as defined by the POEO Act).	No offensive odour was noted at the time of the first site inspection during calm, and sunny conditions. A deodoriser was observed to be in operation during the first site visit. However, during the second site visit, some odour was observed up slope of the tipping face on the high point of the landfill, which was downwind at the time of the inspection. The odouriser was not in operation during the second site visit. There did not appear to be a process for specific management of the face during these more adverse wind conditions. It was noted that the tipping face was being kept small and cover was being used during both site inspections. Minutes of the Whytes Gully Reference Group meeting on 24 May 2017 indicated that one member "mentioned the smell in the morning when the lids are lifted. It was advised that the deodoriser trailer is turned on prior to site start up to minimise odour generated. Another member mentioned that sometimes the smell is as late as 10:00am." No mention of odour was made in the Minutes of the Whytes Gully Reference Group meeting on 22 November 2017. Selected incident reports were provided by WCC for odour complaints on 24 November 2016 (1 complaint); 6 March 2017 (4 complaints); and 17 March 2017 (4 complaints). The reports showed that complaints are followed up with weather data and other factors documented. The EPA issued a letter to WCC dated 30 March 2017 responding to a letter from WCC dated 21 March 2017 in relation to odour complaints made in March 2017. The EPA noted that the identified the cause of the complaints relates to a premises not under the control of WCC. Given the audit site inspections were of limited duration, it was not possible to fully assess compliance with this condition and hence is considered Not Verified.	Not Verified **Recommendation:** WCC to ensure that odouriser is in operation as required to minimise the risk of offensive odour going off site. It is recommended that WCC review the implementation of the procedure regarding the use and placement of the odouriser. **Recommendation:** It is recommended that WCC conduct additional odour monitoring to re-assess the potential for odours during southerly winds and assess if existing controls are adequate to prevent off site odours. Based on the outcomes of the monitoring, additional controls may be warranted.	Council conducts odour monitoring daily and upon the opening of the site as well as regular use of an odour abatement system (deoderisor). Council will undertake an additional odour monitoring trial, specifically southerly winds to see if there are any extra odours generated. This will be reported in the next report.
Sch 4 Condition 36	The Proponent shall ensure that	No queuing of vehicles noted during the site audit, however it was indicated that some waste trucks are likely to queue on the road outside the facility before 7:30 am waiting for the site and weighbridge to be opened. Due to the extra lane on the road adjacent to the entrance to the facility, trucks are able to queue and not obstruct local traffic.	Not Verified	

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation	Actions
	c) the project does not result in any vehicles queuing on the public road network;	During operating hours, there is room for vehicles to queue on site prior to having to stop.	**Recommendation:** That WCC manage the road in accordance with the condition. Alternatively, confirm with RMS that current arrangements related to trucks parking outside the facility prior to opening is acceptable, and notify DPE of the outcomes of this consultation	Council to issue instruction to customers (operational) and contractors (construction) not to arrive at the site prior to site opening hours.
	d) heavy vehicles and bins associated with the project do not park or stand on local roads or footpaths in the vicinity of the site; e) all vehicles are wholly contained on site before being required to stop;	Consultation with RMS did not identify any traffic related issues relating to WCC Operations in this location. Auditors did not observe trucks queuing on public roads, and hence were unable to verify from observation the extent and nature of queuing on public roads. Hence auditors were not able to verify if WCC are not compliant with sub conditions c, d and e.		
Sch 4 Condition 45	The Proponent shall:	During the site inspections, numerous weeds including noxious weeds were evident across the site. Current weed controls appeared limited and was not able to be explained in detail by WCC. Based on site observations, weed controls measures across the site were not adequate or effective.	Non-compliant	Council notes compliance with pest species management and the auditors opinion that noxious weed control should be improved.
	a) implement suitable measures to manage pests, vermin and declared noxious weeds on site; and	WCC reported that the site is inspected monthly and control undertaken periodically derived from inspection results. Implementation records provided included: 1) a schedule of weed management visits for all of council's sites. This indicated site visits on 7 occasions were scheduled over 2017; 2) emails discussing various weed areas and requesting weed control services during 2016 and 2017;	**Recommendation:** Implement the controls in the program as defined by Biosis for pest, vermin and noxious weeds management.	Council has a weed crew regulary visit the site to remove and posion non native vegetion. Council will continue to implement an improved noxious weed control measures as recommended.
	b) inspect the site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in surrounding area.	WCC did not demonstrate that a systematic and through approach is taken to management and control of weeds at the site.		Council notes that the referenced Biosis report is a document that was created as a specification for contract weed control. Council believes that this document is auxillory to this audit as the implementation of day labor vs contract staff and their relative effectiveness is not in the audit scope.
	Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Noxious Weed Act 1993	Biosis Pty Ltd was commissioned by Wollongong City Council to review the existing Whytes Gully New Landfill Cell Vegetation Management Plan (VMP), prepared by Biosis (2013). A field investigation was undertaken on 20 June 2017 by Botanist, Bianca Klein. This report details the results of the field investigation, including vegetation condition assessments and provides recommendations for management of the VMP site. Management actions have been formulated based on the requirement for each management zone, as outlined in Biosis (2013), to satisfy the condition criteria outlined in the VMP to date. These management actions are proposed to be undertaken within a 12-month period, with consideration to the current condition of the site and the ongoing viability of the site during and after the VMP works. WCC provided a screen shot of records for Wild Dear Operation - Feral Animal Control - Whytes Gully with latest record dated 24, 25, 26 October 2017. Given the extent of weeds across the site, WCC are considered not compliant with this condition. Implementation of the control measures defined by Biosis will go towards addressing compliance issues with this condition.		
Sch 4 Condition 49	The Proponent shall prepare and implement a Vegetation Management Plan for the project to the satisfaction of the Director-General.	Implementation: Based on the issues related to weeds identified above in Condition 45; and outcomes of the Biosis report where more stringent weed actions are defined to be required, WCC are considered to be Non Compliant with the implementation of the weed controls measures identified in the Vegetation Management Plan.	Non-compliant (Implementation)	Council has a weed crew regulary visit the site to remove and posion non native vegetaion. Council will implement and improve the Vegetation Management Plan in full and report back in the next report.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation	Actions
			Recommendation: It is recommended WCC implement weed controls as defined in the Vegetation Management Plan. **Recommendation:** That WCC complete the implementation of the Vegetation Management Plan in full (in addition to weed management as defined above) and in regard to Offsets as detailed in the Vegetation Management Plan. **Recommendation:** Report progress in implementation of the VMP in Annual Environmental Reports.	
Sch 5 Condition 3h	Prior to the commencement of operation, the Proponent shall update the draft Landfill Environmental Management Plan in the EA for the site to the satisfaction of the Director-General. This plan must: h) be placed on Council's website within 2 weeks of its approval.	At the time of the audit site inspections (hence for the audit period), the Draft LEMP was posted in DPE website, and the final LEMP was not posted on the WCC website, hence at the time of the audit WCC were not compliant with this condition. As of 26 February, the Final LEMP was located on the WCC website.	Non-Compliant	The LEMP has been listed on the Wollongong Council Website.
Sch 5 Condition 4	The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: a protocol for periodic review of the plan.	The requirement for periodic review is documented in the LEMP and CEMPF. Based on discussions with WCC, annual reviews of the LEMP and CEMPF were not conducted. The latest version of the LEMP and CEMPF were dated 2014. Following issue of the Draft Report, WCC indicated that they consider completing the checklist provided in Section G of the EPL Annual Return as a review of the adequacy of the LEMP and CEMPF.	Non-compliant Recommendation: Implement a formal review process for the LEMP and CEMPF. Where relevant and based on the findings of the review, update the LEMP.	 Council have implementated a Formal management review to take place prior to the Issue of the Annual Environmental Report.
Sch 5 Condition 5	One year after the commencement of operation, and annually thereafter, the Proponent shall review the environmental performance of the Project to the satisfaction of the Director-General. This review must: a) describe the operations that were carried out in the past calendar year; b) analyse the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the · relevant statutory requirements, limits or performance measures/criteria; · monitoring results of previous years; and · relevant predictions in the EA; c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	WCC provided Annual Reports that incorporate Annual Returns required under the Environmental Protection Licence for the years 2012-2013 to 2016-2017. The objective of the Annual Report is stated as being required under Condition R1.8 of the EPL which specifies that WCC must provide an Annual Report to accompany the Annual return for the site. The objective does not appear to reflect the requirements of this condition with thin the Project Approval. The Annual Report address some of the requirements of the condition, however, these reports do not consider compliance with the Project Approval nor meet all aspects of this condition. Specifically, the reports do not cover the following aspects of the condition: - 5a) describe the operations that were carried out in the last year; - 5b) third bullet point: Provide a comparison of results against the relevant predictions in the EA; or - 5c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; In summary, WCC are compliant with many aspects of the condition, however, the scope of current reports do not address some aspects of the condition.	Non-compliant **Recommendation:** It is recommended WCC increase the scope of the Annual Reports to address all of the requirements of Condition 5 (Schedule 5) specific to the Project Approval.	 Council has amended the scope for the Annual report to address all concerns in Schedule 5.
Sch 5 Condition 9	Within a year of the commencement of operation of the project, and every 5 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the Project.	This audit is the first audit to be commissioned by WCC since Approval for the Project and since Stage 1 operation of new cell commencing in 2014. To comply with this condition an audit was required in 2015. An independent environmental audit was not conducted a year after commencement of operation of Stage 1, hence WCC are non compliant with the timing related to this condition.	Non-compliant	Noted.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation	Actions
Sch 5 Condition 11	From the commencement of construction of the project, the Proponent shall make the following information publicly available on its (Council's) website as it is progressively required by the approval:	The LEMP and CEMPF were not posted on the WCC website at the time of the site inspections and hence WCC are considered as non compliant with this condition. As of 26 February, the documents were sighted on the website.	Non-compliant	Council has listed the LEMP and CEMPF on the Wollongong Council website.
	c) a copy of the current plans and programs required under this approval; a complaints register, which is to be updated on a monthly	All complaints are logged into Councils Customer Request Management System 'Pathways'. Complaints are reported to the community via the annual returns which are published on our website. WCC do not have a register of all complaints posted on the WCC website as required of the Condition. WCC have a complaints form in the LEMP, however, evidence of the use of this form was not provided by WCC and an Environmental Incident Report form was sighted for complaints.	**Recommendation:** It is recommended that a register of complaints, updated monthly, is provided on the WCC website. **OFI:** Update the LEMP with the form being used by WCC for the recording of complaints.	A register of complaints has been listed on the website and is updated monthly.
Statement of Commitment	If the Project is approved, it is proposed that Wollongong City Council would surrender existing development consents of relevance to the Project site. This does not include the existing development consent for the MRF, which is not affected by the Project	Refer to Schedule 3; Condition 7.	Non-compliant	All of the relevant DA consents have been surrendered by the 27th March 2018. This appears to be a duplicated non-compliance with Sch3 Con7
Statement of Commitment	Wollongong City Council commit to: Screen planting with dense tall tree planting on natural ground would be used to block views to the site, particularly from adjoining residences.	Landscape strategy is documented in the LEMP. Section 4 of the Landscape Strategy states that "the proposed planting along sections of the site boundary is intended to provide visual screening of the landfill operations from adjoining properties. In order to fulfil this function, the planting will need to be carried out in advance of landfill operations. A minimum of 5 years growth will be required to provide the intended visual screening. WCC did not provide evidence of where trees have been planted for screening purposes. Minutes of the Whytes Gully Reference Group meetings on 24 May and 22 November 2017 indicated questions from members as to why screening trees had not been planted at the boundary of the site.	Non-compliant Recommendation: WCC to conduct screen planting with dense tall tree planting on natural ground to block views to the site, particularly from adjoining residences.	The consent operations have not yet moved in the area that has designated screen planting. The existing operational area does not impact the proposed screen planting location. The intent of the screen planting is to screen views when the operational area moves west towards the adjoinging property and towards the proposed planting area. Council to expedite screen planting.

Table 8-2 - Non-Compliant and Not Verified Conditions - Environmental Protection Licence 5862

L2.1	For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	Based on the monthly reports posted in WCC council and annual returns to EPA, there were 3 occurrences of non-compliances reported to EPA since 2013 against this condition: • L2.1/L2.4 - Exceed TSS Concentration Limit at LDP1 (x1, minor) after heavy rainfall event on 25/08/2015 (approximately 150mm over 24hours). Action taken by licensee. EPA has written to licensee regarding non-compliance and relevant action. (1 occurrence); • L2.1/L2.4 -Exceed limit for TSS at LDP 1 (minor) on 2 occasions due to high intensity rainfall events in June and July 2016. The licensee is addressing non-compliances. EPA has written to licensee regarding non-compliance and relevant action. (2 occurrences). Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. WCC consider these are historic results and that it has implemented amended controls to eliminate recurrence. WCC consider that controls implemented are performing as designed. Specifically, a Wet Weather and Stormwater Management Work instruction was created in July 2016 and implemented to ensure that the sediment pond capacity is maintained between rainfall events.	Non-compliant **Recommendation:** It is recommended that WCC continue to monitor the effectiveness of the controls defined in the Wet Weather and Stormwater Management work instruction and implement additional mitigation measures as required.	This non compliance has been reported to the EPA and additional processes and procedures have been placed around the sites storm water management and reviewed after each event. This non-compliance is a replication of a historic EPL non compliance and has since been managed to the satisfaction of the EPA. This consent condition is a replication of EPL conditions.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation	Actions
		Since the implementation of the new work instruction, there were no further reported elevated TSS discharges. There was no reported exceedance to the water/land concentration limits since July 2016. Based on the exceedences of the criteria as reported, WCC is assessed as Non compliant with this condition. Review of water quality monitoring spreadsheets provided by WCC also indicated exceedences of the criteria at LDP1 on 2 occasions in August 2014; and one occasion in March 2016. It was not evident that these events were reported to the EPA based on documents sighted.		
L4.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.	Refer to Sch 4 Condition 23.	Not Verified Refer to recommendations made in the MCoA Checklist for Conditions 23 and 26; Schedule 4.	
O6.8	The licensee must not exhume any landfilled waste unless approved in writing by the EPA.	The process of exhumation of the landfill is defined in the LEMP. Two-2 Penalty Notices (1521880 and 1521881) were raised on 22 May 2014 regarding exhumation of waste: o O6.4 -Non-compliance with Condition O6.4 - The licensee must not exhume any landfilled waste unless approved in writing by the EPA. Penalty Notice issued. WCC consider this to be an historic incident for which Council has implemented amended controls to eliminate recurrence. Controls implemented are performing as designed. WCC has not exhumed any landfilled waste unless approved in writing by the EPA since this event in 2014. An approval for exhumation of waste for the removal of rainflap was granted in October 2017. Given the events in 2014, WCC were not compliant with this condition at this time. Since May 2014 it is considered that WCC has been compliant with the condition hence no recommendation is made.	Non-compliant	This non compliance has been reported to the EPA and additional processes and procedures have been placed around the the area of waste exhumation. Since 2014 this has not occurred since. This non-compliance is a replication of a historic EPL non compliance and has since been managed to the satisfaction of the EPA. This consent condition is a replication of EPL conditions.
O7.3	Disturbed areas must be provided with separate water quality controls for the treatment of runoff containing suspended or turbid pollutants.	During the audit inspections, it was observed that generally disturbed areas within the operation facilities were spray grassed or covered with geofabric. Swales or drainage were generally lined with gravel, and sand bags or check dams were also place within the swales. However, limited erosion and sedimentation controls were noted within the construction areas of cells 2 and 3 and at the newly constructed leachate pond (see photos below). The lack of controls in these areas was reported by WCC to have been from recent construction activities conducted in and adjacent to the drainage line. Issues on this area were also noted in the Whytes Gully Inspection November 2017 Report prepared by the WCC surveillance officer from the public works division. Photo below was taken at the outlet of stormwater swale from the construction of Cell 2 & 3. Note that there was no sediment control prior to the entry to the culvert. WCC noted that since the site inspection, it has and continues to address these issues with the construction contractor on the site. A stop work order was issued in October 2017 and rectification implemented before work could recommence. Performance management of the contractor is ongoing.	Non-compliant **Recommendation:** That WCC and its contractors review the processes for installation of ERSED controls in construction areas and ensure that controls are effective and placed promptly after works are completed.	Council has been working closely with the construction team to ensure that the ERSED controls are adequate. The ERSED controls discuss exist internal to the site. Councils discharge of stormwater has not been over the EPL limit.
R4.1	The licensee must maintain a daily log and record the following data of fires at the site: a) Time and date when the fire was deliberately started or reported. b) Whether the fire was authorised by the licensee, and, if not, the circumstances which ignited the fire.	Two fires were recorded in the WHS records management system. Register of events were provided for WGRRP from 2013 to 2017. The fires occurred on 31-7-2013 and 21-8-2013. The system did not report fires after this event. The system indicated that the first fire was reported to the EPA, and a separate email indicated that the second fire was also reported to the EPA. The data provided to auditors did not address all of the requirements of the conditions a to h. As such, Auditors were not able to verify compliance with this condition.	Not Verified **Recommendation:** It is recommended that WCC record all details as defined in the condition relating to fires at the site and ensure that the EPA are notified of details of fires occurring on site as defined in the condition.	Council has reviewed the incident form for fires and has will make amendments to expressively ensure all individual conditions are included in the report template.

Condition Number	Condition	Comments and Evidence Sighted for Audit Period	Compliance Status (C/O/NC/NA) and Recommendation	Actions
	c) The time and date that the fire ceased and whether it burnt out or was extinguished. d) The location of fire (eg. clean timber stockpile, putrescible garbage cell, etc). e) Prevailing weather conditions. f) Observations made in regard to smoke direction and dispersion. g) The amount of waste that was combusted by the fire. h) Action taken to extinguish the fire.			
R4.2	The licensee or its employees or agents must notify the EPA in accordance with conditions R2.1 and R2.2 of all fires at the premises as soon as practical after becoming aware of the incident.	See response to above condition R4.1.	Not Verified	Councils incident process includes a note to to call the EPA for all relevant incidents. A record of this was with the fire on the 24/12/17. The EPA where notified and kept in the loop when a small fire was noticed on the tip face.

Project Approval MP11_0094

APPENDIX

E

PROJECT CONDITIONS PROPOSED FOR REMOVAL

Project Approval MP11_0094

APPENDIX F

FIGURES

Location Plan

WHYTES GULLY WASTE DISPOSAL DEPOT

Legend

- Site Boundary
- Distance Buffer
- Major Watercourse (LPI)

Land Use (ABS, 2016)

- Other
- Commercial
- Education
- Hospital/Medical
- Industrial
- Parkland
- Primary Production
- Residential
- Water

FIGURE 1

1:60,000 Scale at A3

km
0 0.5 1 1.5 2

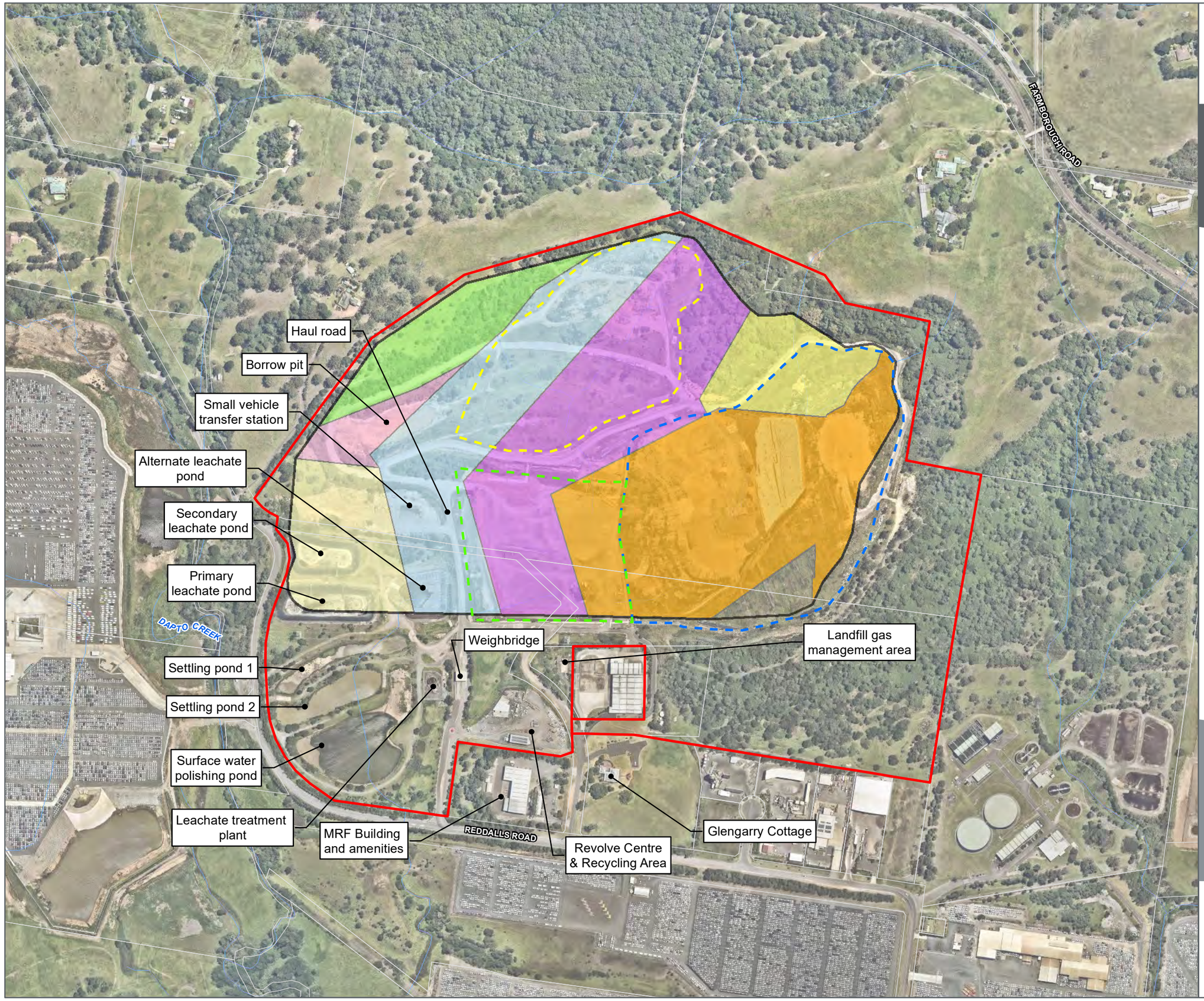
N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-06-15 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-006-LocationPlan.mxd 01

Site Plan

WHYTES GULLY WASTE DISPOSAL DEPOT



Legend

- Site Boundary
- Eastern Gully Landfill
- Western Gully Landfill
- New Landfill (Under Construction)
- Extent of Landform
- Stage 1
- Stage 2A
- Stage 2B
- Stage 3
- Stage 4-1
- Stage 4-2A
- Stage 4-2B
- Watercourse (LPI)
- Cadastre (DFSI-SS, 2017)

FIGURE 2

1:5,000 Scale at A3

m
0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-08-31 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-001-SitePlan.mxd 03
Aerial imagery supplied by nearmap (January, 2018)

ID	Latitude	Longitude
1	-34.461282	150.798123
2	-34.461707	150.801046
3	-34.461173	150.798302
4	-34.461495	150.801312
5	-34.461167	150.797993
6	-34.460442	150.802531
7	-34.460744	150.799456
8	-34.460662	150.800985
9	-34.460543	150.79948
10	-34.460406	150.801562
11	-34.460363	150.79919
12	-34.460305	150.801931
13	-34.459877	150.799587
14	-34.460263	150.802198
15	-34.459746	150.799557
16	-34.46015	150.802252
17	-34.459633	150.799504
18	-34.460049	150.802359
19	-34.459466	150.800126
20	-34.459508	150.802163
21	-34.459317	150.800473
22	-34.459198	150.80202
23	-34.45887	150.800838
24	-34.459055	150.802454
25	-34.458568	150.801338
26	-34.458847	150.802561
27	-34.458401	150.801948
28	-34.458776	150.80268
29	-34.463136	150.802109
30	-34.462029	150.801591
31	-34.463059	150.802341
32	-34.461703	150.801685
33	-34.462976	150.802555
34	-34.461435	150.801757
35	-34.46328	150.803183
36	-34.46102	150.80182
37	-34.463113	150.803519
38	-34.460763	150.802258
39	-34.463006	150.803882
40	-34.460828	150.80296
41	-34.463095	150.804387
42	-34.46081	150.803324
43	-34.462768	150.804721
44	-34.460816	150.803691
45	-34.46244	150.805036
46	-34.460834	150.804042
47	-34.461257	150.804917
48	-34.460364	150.8034

Surface Gas Monitoring Locations

WHYTES GULLY WASTE DISPOSAL DEPOT

Legend

- Site Boundary
- Surface Gas Monitoring Transect
- Cadastre (DFSI-SS, 2017)

FIGURE 3

1:5,000 Scale at A3

m
0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-06-15 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-002-SurfaceGas.mxd 01
Aerial imagery supplied by nearmap (January, 2018)

EPL ID	Latitude	Longitude
1	-34.465788	150.798241
2	-34.461495	150.798117
5	-34.462361	150.798127
9	-34.458563	150.800373
10 / 28	-34.460495	150.805903
11	-34.461171	150.796442
12 / 25	-34.462304	150.805465
13 / 24	-34.463246	150.804627
14	-34.463322	150.799269
15	-34.463408	150.799345
16	-34.465054	150.796328
17	-34.463322	150.79609
18	-34.462247	150.79629
19	-34.465092	150.796432
20	-34.465292	150.798669
21	-34.463294	150.801753
22	-34.463579	150.802467
23	-34.463598	150.80419
26	-34.461599	150.806093
27	-34.460933	150.805969
29	-34.460077	150.805912
30	-34.459686	150.805817
31	-34.459629	150.805265
32	-34.459544	150.804713
33	-34.466937	150.796376
34	-34.460624	150.795442
Glengarry Cottage	-34.465023	150.801355
Leachate Treatment Plant	-34.463926	150.798743
SWERF	-34.463935	150.801647
Weighbridge	-34.46375	150.799164

Groundwater, Surface Water and Subsurface Gas Monitoring Locations

WHYTES GULLY WASTE DISPOSAL DEPOT

Legend

- Site Boundary
- Dual Well (Groundwater and Gas)
- Gas Accumulation Monitoring Point
- Groundwater Monitoring Well
- Stormwater Monitoring Point
- Subsurface Gas Monitoring Well
- Trade Wastewater Monitoring Point
- Inferred Groundwater Flow Direction
- 5m Contours (LPI LiDAR, 2013)
- Cadastre (DFSI-SS, 2017)

FIGURE 4

1:5,000 Scale at A3

m
0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-07-19 | Project: 8201819601
Coordinate System: GDA 1994 MGA Zone 56
Map: 82018196-GS-004-Groundwater-SubsurfaceGas.mxd 03
Aerial imagery supplied by nearmap (January, 2018)

Project Approval MP11_0094

APPENDIX G

DUST MONITORING RESULTS

CERTIFICATE OF ANALYSIS

Work Order	: **EW1802556**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: DELLA KUTZNER	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully PM10 and TSP	Date Samples Received	: 21-Jun-2018 14:56
Order number	: 3071587	Date Analysis Commenced	: 25-Jun-2018
C-O-C number	: ----	Issue Date	: 26-Jun-2018 11:43
Sampler	: Glenn Davies		
Site	: Monthy HVAS		
Quote number	: SY/454/14 Tender		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: **FILTER** (Matrix: **AIR**)			Client sample ID	**Glengarry Cottage PM10 9574519**	**Glengarry Cottage TSP 9574518**	**Landfill PM10 9574517**	**Landfill TSP 9574516**	**----**
			Client sampling date / time	20-Jun-2018 00:00	20-Jun-2018 00:00	19-Jun-2018 00:00	19-Jun-2018 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**EW1802556-001**	**EW1802556-002**	**EW1802556-003**	**EW1802556-004**	**-------**
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø **Total Suspended Particulates**	----	0.1	µg/m³	**----**	**28.2**	**----**	**8.7**	**----**
ø **PM10**	----	0.1	µg/m³	**11.5**	**----**	**4.3**	**----**	**----**
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	**----**	**44.5**	**----**	**13.7**	**----**
PM10 (mass per filter)	----	0.1	mg/filter	**17.8**	**----**	**6.6**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **EW1802319**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 07-Jun-2018 11:35
Order number	: 3071587	Date Analysis Commenced	: 12-Jun-2018
C-O-C number	: ----	Issue Date	: 18-Jun-2018 09:57
Sampler	: Glenn Davies		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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- General Comments
- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m².mth.
- Sampling completed as per FWI-EN010 Sampling of Dust Depositon Gauges.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)

Compound	CAS Number	LOR	Unit	Client sample ID	DDG 1 07/05/2018 - 07/06/2018	DDG 2 07/05/2018 - 07/06/2018	DDG 3 07/05/2018 - 07/06/2018	DDG 4 07/05/2018 - 07/06/2018	DDG 5 07/05/2018 - 07/06/2018
				Client sampling date / time	07-Jun-2018 08:50	07-Jun-2018 09:00	07-Jun-2018 08:25	07-Jun-2018 08:40	07-Jun-2018 08:45
					EW1802319-001	EW1802319-002	EW1802319-003	EW1802319-004	EW1802319-005
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.5**	**0.6**	**0.4**	**0.2**	**0.2**
Ash Content (mg)	----	1	mg		**10**	**11**	**7**	**3**	**3**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.4**	**0.3**	**0.4**	**0.4**	**0.3**
Combustible Matter (mg)	----	1	mg		**6**	**6**	**8**	**8**	**6**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**0.9**	**0.9**	**0.8**	**0.6**	**0.5**
Total Insoluble Matter (mg)	----	1	mg		**16**	**17**	**15**	**11**	**9**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1801876**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 07-May-2018 13:57
Order number	: 3071587	Date Analysis Commenced	: 09-May-2018
C-O-C number	: ----	Issue Date	: 15-May-2018 11:48
Sampler	: Robert DaLio		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

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Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m².mth.
- Sampling completed as per FWI-EN010 Sampling of Dust Depositon Gauges.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)

				Client sample ID	DDG 1 09/04/2018 - 07/05/2018	DDG 2 09/04/2018 - 07/05/2018	DDG 3 09/04/2018 - 07/05/2018	DDG 4 09/04/2018 - 07/05/2018	DDG 5 09/04/2018 - 07/05/2018
				Client sampling date / time	07-May-2018 10:00	07-May-2018 10:07	07-May-2018 09:43	07-May-2018 09:50	07-May-2018 09:55
Compound	CAS Number	LOR	Unit		EW1801876-001	EW1801876-002	EW1801876-003	EW1801876-004	EW1801876-005
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	—	0.1	g/m².month		**1.0**	**1.2**	**0.4**	**0.6**	**0.4**
Ash Content (mg)	—	1	mg		**17**	**20**	**6**	**9**	**6**
EA125: Combustible Matter									
Combustible Matter	—	0.1	g/m².month		**1.0**	**0.5**	**0.4**	**0.5**	**0.3**
Combustible Matter (mg)	—	1	mg		**17**	**8**	**8**	**9**	**6**
EA141: Total Insoluble Matter									
Total Insoluble Matter	—	0.1	g/m².month		**2.0**	**1.7**	**0.8**	**1.1**	**0.7**
Total Insoluble Matter (mg)	—	1	mg		**34**	**28**	**14**	**18**	**12**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1801450**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 09-Apr-2018 13:46
Order number	: 3071587	Date Analysis Commenced	: 11-Apr-2018
C-O-C number	: ----	Issue Date	: 18-Apr-2018 16:49
Sampler	: Glenn Davies		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
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- General Comments
- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alison Graham	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m².mth.
- Sampling completed as per FWI-EN010 Sampling of Dust Depositon Gauges.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 09/03/2018 - 09/04/2018**	**DDG 2 09/03/2018 - 09/04/2018**	**DDG 3 09/03/2018 - 09/04/2018**	**DDG 4 09/03/2018 - 09/04/2018**	**DDG 5 09/03/2018 - 09/04/2018**
				Client sampling date / time	09-Apr-2018 09:10	09-Apr-2018 10:15	09-Apr-2018 08:15	09-Apr-2018 08:50	09-Apr-2018 08:54
Compound	*CAS Number*	*LOR*	*Unit*		**EW1801450-001**	**EW1801450-002**	**EW1801450-003**	**EW1801450-004**	**EW1801450-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.8**	**1.2**	**0.2**	**0.7**	**0.4**
Ash Content (mg)	----	1	mg		**14**	**23**	**4**	**12**	**8**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.6**	**1.2**	**0.2**	**0.3**	**0.3**
Combustible Matter (mg)	----	1	mg		**11**	**21**	**3**	**6**	**4**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**1.4**	**2.4**	**0.4**	**1.0**	**0.7**
Total Insoluble Matter (mg)	----	1	mg		**25**	**44**	**7**	**18**	**12**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1801208**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: DELLA KUTZNER	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully PM10 and TSP	Date Samples Received	: 21-Mar-2018 11:57
Order number	: 3071587	Date Analysis Commenced	: 26-Mar-2018
C-O-C number	: ----	Issue Date	: 26-Mar-2018 14:30
Sampler	: Glenn Davies		
Site	: Monthy HVAS		
Quote number	: SY/454/14 Tender		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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Signatories

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Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: **FILTER** (Matrix: **AIR**)				Client sample ID	**Glengarry Cottage PM10 9564077**	**Glengarry Cottage TSP 9564078**	**Landfill PM10 9564080**	**Landfill TSP 9564079**	**----**
				Client sampling date / time	19-Mar-2018 00:00	19-Mar-2018 00:00	20-Mar-2018 00:00	20-Mar-2018 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*		**EW1801208-001**	**EW1801208-002**	**EW1801208-003**	**EW1801208-004**	**--------**
					Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³		**----**	**92.4**	**----**	**35.7**	**----**
ø PM10	----	0.1	µg/m³		**52.0**	**----**	**20.4**	**----**	**----**
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter		**----**	**137**	**----**	**54.4**	**----**
PM10 (mass per filter)	----	0.1	mg/filter		**78.5**	**----**	**30.6**	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1801030**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 09-Mar-2018 14:28
Order number	: 3071587	Date Analysis Commenced	: 13-Mar-2018
C-O-C number	: ----	Issue Date	: 19-Mar-2018 13:02
Sampler	: Glenn Davies		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
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Signatories

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Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m².mth.
- Sampling completed as per FWI-EN010 Sampling of Dust Depositon Gauges.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 07/02/2018 - 09/03/2018**	**DDG 2 07/02/2018 - 09/03/2018**	**DDG 3 07/02/2018 - 09/03/2018**	**DDG 4 07/02/2018 - 09/03/2018**	**DDG 5 07/02/2018 - 09/03/2018**
				Client sampling date / time	09-Mar-2018 10:00	09-Mar-2018 10:44	09-Mar-2018 08:45	09-Mar-2018 09:20	09-Mar-2018 09:32
Compound	*CAS Number*	*LOR*	*Unit*		**EW1801030-001**	**EW1801030-002**	**EW1801030-003**	**EW1801030-004**	**EW1801030-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**1.0**	**1.1**	**0.4**	**0.5**	**0.4**
Ash Content (mg)	----	1	mg		**17**	**19**	**7**	**9**	**7**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.4**	**0.4**	**0.4**	**0.4**	**0.5**
Combustible Matter (mg)	----	1	mg		**8**	**7**	**8**	**7**	**9**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**1.4**	**1.5**	**0.8**	**0.9**	**0.9**
Total Insoluble Matter (mg)	----	1	mg		**25**	**26**	**15**	**16**	**16**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1800800**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: DELLA KUTZNER	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully PM10 and TSP	Date Samples Received	: 27-Feb-2018 09:46
Order number	: 3071587	Date Analysis Commenced	: 01-Mar-2018
C-O-C number	: ----	Issue Date	: 06-Mar-2018 16:39
Sampler	: ----		
Site	: Monthy HVAS		
Quote number	: SY/454/14 Tender		
No. of samples received	: 4		
No. of samples analysed	: 4		

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Accreditation No. 825
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Signatories

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Signatories	*Position*	*Accreditation Category*
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW

General Comments

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ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: **FILTER** (Matrix: **AIR**)				Client sample ID	**Glengarry Cottage PM10 9168013**	**Glengarry Cottage TSP 9563900**	**Landfill PM10 9563882**	**Landfill TSP 9564045**	**----**
				Client sampling date / time	20-Feb-2018 00:00	20-Feb-2018 00:00	22-Feb-2018 00:00	22-Feb-2018 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*		**EW1800800-001**	**EW1800800-002**	**EW1800800-003**	**EW1800800-004**	**--------**
					Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³		**----**	**24.2**	**----**	**23.8**	**----**
ø PM10	----	0.1	µg/m³		**12.6**	**----**	**15.8**	**----**	**----**
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter		**----**	**36.8**	**----**	**35.4**	**----**
PM10 (mass per filter)	----	0.1	mg/filter		**18.9**	**----**	**23.2**	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1800491**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 07-Feb-2018 16:00
Order number	: 3071587	Date Analysis Commenced	: 09-Feb-2018
C-O-C number	: ----	Issue Date	: 14-Feb-2018 12:37
Sampler	: Robert DaLio		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

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Signatories

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Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m².mth.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 09/01/2018 - 07/02/2018**	**DDG 2 09/01/2018 - 07/02/2018**	**DDG 3 09/01/2018 - 07/02/2018**	**DDG 4 09/01/2018 - 07/02/2018**	**DDG 5 09/01/2018 - 07/02/2018**
				Client sampling date / time	07-Feb-2018 09:25	07-Feb-2018 09:35	07-Feb-2018 09:03	07-Feb-2018 09:10	07-Feb-2018 09:15
Compound	*CAS Number*	*LOR*	*Unit*		**EW1800491-001**	**EW1800491-002**	**EW1800491-003**	**EW1800491-004**	**EW1800491-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**1.0**	**0.9**	**0.5**	**1.1**	**0.4**
Ash Content (mg)	----	1	mg		**18**	**16**	**8**	**18**	**7**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.9**	**0.7**	**0.6**	**1.5**	**0.5**
Combustible Matter (mg)	----	1	mg		**15**	**11**	**11**	**25**	**8**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**1.9**	**1.6**	**1.1**	**2.6**	**0.9**
Total Insoluble Matter (mg)	----	1	mg		**33**	**27**	**19**	**43**	**15**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1800305**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: DELLA KUTZNER	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully PM10 and TSP	Date Samples Received	: 25-Jan-2018 15:18
Order number	: 3071587	Date Analysis Commenced	: 31-Jan-2018
C-O-C number	: ----	Issue Date	: 06-Feb-2018 09:04
Sampler	: Glenn Davies		
Site	: Monthy HVAS		
Quote number	: SY/454/14 Tender		
No. of samples received	: 4		
No. of samples analysed	: 4		

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Signatories

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Signatories	*Position*	*Accreditation Category*
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW

General Comments

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^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: **FILTER** (Matrix: **AIR**)				Client sample ID	**Glengarry Cottage PM10 9563881**	**Glengarry Cottage TSP 9563880**	**Landfill PM10 9563883**	**Landfill TSP 9563884**	**----**
				Client sampling date / time	23-Jan-2018 00:00	23-Jan-2018 00:00	24-Jan-2018 00:00	24-Jan-2018 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*		**EW1800305-001**	**EW1800305-002**	**EW1800305-003**	**EW1800305-004**	**--------**
					Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³		**----**	**59.3**	**----**	**31.3**	**----**
ø PM10	----	0.1	µg/m³		**32.5**	**----**	**16.7**	**----**	**----**
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter		**----**	**87.9**	**----**	**45.2**	**----**
PM10 (mass per filter)	----	0.1	mg/filter		**47.5**	**----**	**24.5**	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1800029**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 08-Jan-2018 10:30
Order number	: 3071587	Date Analysis Commenced	: 12-Jan-2018
C-O-C number	: ----	Issue Date	: 18-Jan-2018 09:03
Sampler	: Glenn Davies		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 4		

Accreditation No. 825
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ISO/IEC 17025 - Testing

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- Analytical Results

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Signatories

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Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

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~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m².mth.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 2 08/12/2017 - 09/01/2018**	**DDG 3 08/12/2017 - 09/01/2018**	**DDG 4 08/12/2017 - 09/01/2018**	**DDG 5 08/12/2017 - 09/01/2018**	**----**
				Client sampling date / time	09-Jan-2018 10:55	09-Jan-2018 09:50	09-Jan-2018 10:15	09-Jan-2018 10:20	----
Compound	*CAS Number*	*LOR*	*Unit*		**EW1800029-002**	**EW1800029-003**	**EW1800029-004**	**EW1800029-005**	**--------**
					Result	Result	Result	Result	----
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**1.0**	**0.6**	**1.3**	**0.6**	**----**
Ash Content (mg)	----	1	mg		**20**	**12**	**25**	**11**	**----**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.4**	**0.8**	**1.5**	**0.4**	**----**
Combustible Matter (mg)	----	1	mg		**7**	**15**	**28**	**7**	**----**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**1.4**	**1.4**	**2.8**	**1.0**	**----**
Total Insoluble Matter (mg)	----	1	mg		**27**	**27**	**53**	**18**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1705142**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 08-Dec-2017 14:19
Order number	: 3071587	Date Analysis Commenced	: 12-Dec-2017
C-O-C number	: ----	Issue Date	: 15-Dec-2017 12:07
Sampler	: Glenn Davies		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

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Signatories

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Signatories	*Position*	*Accreditation Category*
Alison Graham	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW

General Comments

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Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 08/11/2017 - 08/12/2017**	**DDG 2 08/11/2017 - 08/12/2017**	**DDG 3 08/11/2017 - 08/12/2017**	**DDG 4 08/11/2017 - 08/12/2017**	**DDG 5 08/11/2017 - 08/12/2017**
				Client sampling date / time	08-Dec-2017 08:35	08-Dec-2017 08:45	08-Dec-2017 08:15	08-Dec-2017 08:30	08-Dec-2017 08:25
Compound	*CAS Number*	*LOR*	*Unit*		**EW1705142-001**	**EW1705142-002**	**EW1705142-003**	**EW1705142-004**	**EW1705142-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.6**	**1.0**	**0.3**	**0.6**	**0.2**
Ash Content (mg)	----	1	mg		**10**	**18**	**5**	**10**	**4**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.2**	**0.3**	**0.9**	**2.7**	**0.2**
Combustible Matter (mg)	----	1	mg		**4**	**6**	**17**	**47**	**3**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**0.8**	**1.3**	**1.2**	**3.3**	**0.4**
Total Insoluble Matter (mg)	----	1	mg		**14**	**24**	**22**	**57**	**7**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1704612**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 08-Nov-2017 13:00
Order number	: 3071587	Date Analysis Commenced	: 10-Nov-2017
C-O-C number	: ----	Issue Date	: 15-Nov-2017 08:32
Sampler	: Robert DaLio		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

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Signatories

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Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m².mth.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)

				Client sample ID	DDG 1 09/10/2017 - 08/11/2017	DDG 2 09/10/2017 - 08/11/2017	DDG 3 09/10/2017 - 08/11/2017	DDG 4 09/10/2017 - 08/11/2017	DDG 5 09/10/2017 - 08/11/2017
				Client sampling date / time	08-Nov-2017 09:50	08-Nov-2017 09:30	08-Nov-2017 09:40	08-Nov-2017 10:00	08-Nov-2017 09:55
Compound	CAS Number	LOR	Unit		EW1704612-001	EW1704612-002	EW1704612-003	EW1704612-004	EW1704612-005
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**1.7**	**2.0**	**0.6**	**1.3**	**0.5**
Ash Content (mg)	----	1	mg		**30**	**35**	**11**	**23**	**8**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**1.0**	**0.9**	**0.4**	**1.6**	**0.1**
Combustible Matter (mg)	----	1	mg		**19**	**17**	**7**	**28**	**2**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**2.7**	**2.9**	**1.0**	**2.9**	**0.6**
Total Insoluble Matter (mg)	----	1	mg		**49**	**52**	**18**	**51**	**10**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1704053**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 09-Oct-2017 14:28
Order number	: 3071406	Date Analysis Commenced	: 12-Oct-2017
C-O-C number	: ----	Issue Date	: 17-Oct-2017 16:15
Sampler	: Robert DaLio		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

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Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

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Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)

Compound	CAS Number	LOR	Unit	Client sample ID	DDG 1 07/09/2017 - 09/10/2017	DDG 2 07/09/2017 - 09/10/2017	DDG 3 07/09/2017 - 09/10/2017	DDG 4 07/09/2017 - 09/10/2017	DDG 5 07/09/2017 - 09/10/2017
				Client sampling date / time	09-Oct-2017 09:15	09-Oct-2017 08:30	09-Oct-2017 08:40	09-Oct-2017 09:05	09-Oct-2017 08:55
					EW1704053-001	EW1704053-002	EW1704053-003	EW1704053-004	EW1704053-005
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**2.3**	**0.9**	**0.3**	**0.7**	**0.4**
Ash Content (mg)	----	1	mg		**43**	**18**	**6**	**13**	**7**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.6**	**0.5**	**0.5**	**0.7**	**0.3**
Combustible Matter (mg)	----	1	mg		**12**	**9**	**10**	**13**	**7**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**2.9**	**1.4**	**0.8**	**1.4**	**0.7**
Total Insoluble Matter (mg)	----	1	mg		**55**	**27**	**16**	**26**	**14**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1703764**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 07-Sep-2017 12:15
Order number	: 3071587	Date Analysis Commenced	: 11-Sep-2017
C-O-C number	: ----	Issue Date	: 15-Sep-2017 09:10
Sampler	: Robert DaLio		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

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Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

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Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 08/08/2017 - 07/09/2017**	**DDG 2 08/08/2017 - 07/09/2017**	**DDG 3 08/08/2017 - 07/09/2017**	**DDG 4 08/08/2017 - 07/09/2017**	**DDG 5 08/08/2017 - 07/09/2017**
				Client sampling date / time	07-Sep-2017 08:32	07-Sep-2017 08:05	07-Sep-2017 08:15	07-Sep-2017 08:22	07-Sep-2017 08:25
Compound	*CAS Number*	*LOR*	*Unit*		**EW1703764-001**	**EW1703764-002**	**EW1703764-003**	**EW1703764-004**	**EW1703764-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.7**	**0.6**	**0.2**	**0.7**	**0.4**
Ash Content (mg)	----	1	mg		**13**	**10**	**4**	**12**	**7**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.2**	**0.3**	**0.5**	**0.3**	**0.1**
Combustible Matter (mg)	----	1	mg		**3**	**6**	**8**	**5**	**1**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**0.9**	**0.9**	**0.7**	**1.0**	**0.5**
Total Insoluble Matter (mg)	----	1	mg		**16**	**16**	**12**	**17**	**8**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1703384**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 08-Aug-2017 13:18
Order number	: 3071406	Date Analysis Commenced	: 10-Aug-2017
C-O-C number	: ----	Issue Date	: 15-Aug-2017 09:17
Sampler	: Robert DaLio		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
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Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

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ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m2.month.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 10/07/2017 - 08/08/2017**	**DDG 2 10/07/2017 - 08/08/2017**	**DDG 3 10/07/2017 - 08/08/2017**	**DDG 4 10/07/2017 - 08/08/2017**	**DDG 5 10/07/2017 - 08/08/2017**
				Client sampling date / time	08-Aug-2017 12:10	08-Aug-2017 12:55	08-Aug-2017 09:05	08-Aug-2017 09:50	08-Aug-2017 10:00
Compound	*CAS Number*	*LOR*	*Unit*		**EW1703384-001**	**EW1703384-002**	**EW1703384-003**	**EW1703384-004**	**EW1703384-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.6**	**0.6**	**0.5**	**0.4**	**0.4**
Ash Content (mg)	----	1	mg		**11**	**11**	**8**	**6**	**7**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.3**	**0.2**	**0.5**	**0.3**	**0.2**
Combustible Matter (mg)	----	1	mg		**4**	**2**	**9**	**5**	**3**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**0.9**	**0.8**	**1.0**	**0.7**	**0.6**
Total Insoluble Matter (mg)	----	1	mg		**15**	**13**	**17**	**11**	**10**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1702888**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 10-Jul-2017 15:00
Order number	: 3071587	Date Analysis Commenced	: 12-Jul-2017
C-O-C number	: ----	Issue Date	: 19-Jul-2017 09:09
Sampler	: Robert DaLio		
Site	: Whytes Gully LANDFILL		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2003. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m2.month.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 08/06/2017 - 10/07/2017**	**DDG 2 08/06/2017 - 10/07/2017**	**DDG 3 08/06/2017 - 10/07/2017**	**DDG 4 08/06/2017 - 10/07/2017**	**DDG 5 08/06/2017 - 10/07/2017**
				Client sampling date / time	10-Jul-2017 12:20	10-Jul-2017 12:40	10-Jul-2017 11:45	10-Jul-2017 12:12	10-Jul-2017 12:15
Compound	*CAS Number*	*LOR*	*Unit*		**EW1702888-001**	**EW1702888-002**	**EW1702888-003**	**EW1702888-004**	**EW1702888-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.3**	**0.3**	**0.1**	**0.2**	**0.1**
Ash Content (mg)	----	1	mg		**6**	**5**	**2**	**3**	**2**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.5**	**0.2**	**0.2**	**0.1**	**0.3**
Combustible Matter (mg)	----	1	mg		**9**	**4**	**4**	**3**	**5**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**0.8**	**0.5**	**0.3**	**0.3**	**0.4**
Total Insoluble Matter (mg)	----	1	mg		**15**	**9**	**6**	**6**	**7**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW1702522**	Page	: 1 of 2
Client	: **WOLLONGONG CITY COUNCIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR WAYDE PETERSON	Contact	: Glenn Davies
Address	: 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW
Telephone	: +61 02 4227 7111	Telephone	: 02 42253125
Project	: Whytes Gully Dust Deposition	Date Samples Received	: 08-Jun-2017 10:30
Order number	: 3058354	Date Analysis Commenced	: 13-Jun-2017
C-O-C number	: ----	Issue Date	: 19-Jun-2017 16:25
Sampler	: Robert DaLio		
Site	: Monthy Dust		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW

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Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**DDG 1 08/05/2017 - 08/06/2017**	**DDG 2 08/05/2017 - 08/06/2017**	**DDG 3 08/05/2017 - 08/06/2017**	**DDG 4 08/05/2017 - 08/06/2017**	**DDG 5 08/05/2017 - 08/06/2017**
				Client sampling date / time	08-Jun-2017 09:00	08-Jun-2017 09:45	08-Jun-2017 09:35	08-Jun-2017 10:00	08-Jun-2017 09:55
Compound	*CAS Number*	*LOR*	*Unit*		**EW1702522-001**	**EW1702522-002**	**EW1702522-003**	**EW1702522-004**	**EW1702522-005**
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.4**	**1.2**	**0.4**	**0.6**	**0.5**
Ash Content (mg)	----	1	mg		**8**	**22**	**7**	**10**	**10**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.3**	**0.6**	**0.2**	**0.4**	**0.4**
Combustible Matter (mg)	----	1	mg		**5**	**12**	**5**	**8**	**7**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**0.7**	**1.8**	**0.6**	**1.0**	**0.9**
Total Insoluble Matter (mg)	----	1	mg		**13**	**34**	**12**	**18**	**17**